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TECHNICAL REPORT

RESULTS OF THE MEASUREMENT OF PM10 PRECURSOR COMPOUNDS (PM10PCs) FROM DAIRY INDUSTRY LIVESTOCK WASTE: SUMMER TESTING EVENT (09/26/95-10/07/95) AND WINTER TESTING EVENT (12/11/95-12/14/95)

FINAL

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Field measurements were conducted at five dairies in the South Coast Air Basin during two seasons in order to assess the air emissions of PM10 precursor compounds (PM10PCs) from various area sources with livestock wastes representing air emissions from the dairy industry. Testing was conducted during late summer (09/26/95 through 10/07/95) and early winter (12/11/95 through 12/14/95). The objective of this testing effort was to determine what PM10PCs and at what level PM10PCs are being emitted (flux) to the atmosphere from the surface and subsurface livestock waste in the various surface areas of dairies. The flux of compounds from different areas with livestock wastes was measured and the data were used to generate emission factors (lbs/yr) to estimate air annual emissions by compound from dairy wastes.

A detailed survey-level field program was conducted on 08/10/95 and 08/11/95 and ammonia emissions were screened using real-time colorometric tubes. Four dairies and 28 different types of sources/surface areas were tested. These data were used to assist in developing a detailed technical approach for assessing PM10PCs. A two-phase field program was developed which included summer and winter field testing. The summer testing included testing at four dairies with ammonia flux measurements at all locations of interest and full PM10PCs measurement at eight locations. Flux measurements were made using the EPA recommended surface isolation flux chamber. Gas samples were collected by: acid-coated charcoal for ammonia (OSHA ID-188); evacuated stainless steel canisters for volatile organic compounds (EPA Method TO-14); impinger solution for carbonyl compounds (aldehydes/ketones) (EPA Method TO-5); tedlar bags for reduced sulfur compounds (ASTM D-5504); PUF/XAD resin for semi-volatile organic compounds (EPA Method TO-13); and silica gel sorbent for amine compounds (NIOSH 2010).

Approximately 180 air samples were collected at 4 dairies and 64 locations representing unique area sources (ie., corral dry manure, corral feeder area, corral water trough area, corral shade area, corral thick manure area, liquid storage, parlor rinsate, stockpile, and pasture) for the summer event and 130 air samples were collected at 4 dairies and 60 locations representing unique area sources for the winter event using the flux chamber. Both milk cow corrals and dry cow corrals were tested. In addition, thick manure in corrals and stockpiled manure stored outside of the corrals was tested. Studies were also conducted in order to quantify the diurnal effects of PM10PC emission from livestock wastes. The results of the field testing were compared to laboratory (instrument) blank levels, trip blank levels, and flux chamber system blank levels. Quality control data indicated acceptable performance of the sampling and analytical methods when compared to quality control criteria. Reported flux data can be used to estimate air emissions from the dairy industry using PM10PCs emission factors on a "per cow" basis. Representative flux

data, along with surface area information representing area sources, can be used to calculate emission rate data.

Field data indicate that a variety of compounds are emitted from one or more of the area sources at dairies at relatively low levels (typical concentrations in the flux chamber of 1-to-10 ppbv when detected). Hydrocarbon compounds emitted include aromatic hydrocarbon compounds (benzene, toluene, xylenes, styrene), oxygenated compounds (aldehyde, ketones, alcohols), chlorinated compounds, and reduced sulfur compounds. All of these compounds were either at or near method detection limits and are not emitted at significant levels. The study compound reported at the highest flux was ammonia. The source with the highest ammonia flux was disturbed stockpiles. No amine compounds were detected above method limits.

No summary statement can be made regarding the relative ranking of area sources at the dairies tested or all dairies without the calculation of emission rates using flux data and area source surface area information (since emissions are a function of surface area). The flux data can be used as "emission factors" on a dairy-by-dairy basis (and summed over all dairies) to estimate total emissions from dairies or with assumed surface area information to estimate emissions from dairy industry. It is also possible to prorate flux or emission rate based on "number of cattle" by dividing flux or emission rate for a given area source by the number of cattle that use the area source to estimate air emissions from the dairy industry. Emissions from dairies can be estimated using this approach. However, the assumption with this approach is that the surface area per source is proportional to number of cows managed per dairy per area source, <u>and</u>, that this holds true for all Southern California dairies.

The results of the testing include emission estimates from the dairies tested, emission factors representing unit processes per dairy tested, and most importantly, an estimate of the annual averaged emissions per cow for ammonia. The late summer/early fall emission factor was calculated per each dairy tested, namely: 19, 21, 39, and 20 pounds per cow. It is believed that the 39 pounds per year is not representative because the dairy tested had over 1,200 cows earlier in the year and had recently down-scaled to 360 cows. Thus, the emissions from corrals were higher per cow because the corrals had manure from cows not accounted for. The average of the three representative dairies is 20 pounds of ammonia emissions per year per cow for the late summer/early fall season. Similarly, the winter emission factor was calculated per each dairy tested, namely: 9.7, 8.8, 9.4, and 14 pounds per cow for an average winter months emissions of 11 pounds per cow per year.

I. INTRODUCTION

This technical report describes the field testing that was conducted in order to estimate the surface emission rate of PM10PCs from various areas with livestock wastes at four dairies located in the South Coast Air Basin. Testing was conducted by Dr. C.E. Schmidt and AIR TOXICS LIMITED on 09/26/95 through 10/07/95 (summer season) and 12/11/95 through 12/14/95 (winter season) with representatives from the South Coast Air Quality District (SCAQMD) and the Milk Producers Council.

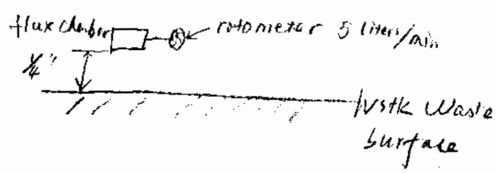
The federal Clean Air Act requires a State Implementation Plan (SIP) for small particulate matter less than 10 microns (PM10) be submitted by all serious PM10 non-attainment areas, including the South Coast Air Basin (Basin). The South Coast Air Quality Management District (SCAQMD) has initiated the PM10 Technical Enhancement Program (PTEP) to improve the monitoring, emissions inventory, and modeling elements necessary for the 1997 PM10 SIP. An important element of the PTEP is the improvement of the inventory of ammonia and volatile organic compounds (VOC) emissions from livestock waste, in particular, the dairy industry. The dairy operations in the Basin are sufficiently different from those in the rest of the state and country to warrant a special study of their emissions.

The SCAQMD was interested in studying the air emissions of PM10PCs such as ammonia, volatile hydrocarbon compounds (VOCs), semi-volatile organic compounds (SVOCs), sulfides, carbonyl compounds, and oxides of nitrogen from the dairy industry in the Basin, in particular, from the management of livestock (cow) manure. This study was intended to be used to help improve emission inventories for the 1997 PM10 SIP. The interest was in completing a representative emissions inventory for PM10 precursor emissions that results in the formation of PM10 in the atmosphere. This program was a detailed study that used the EPA recommended Surface Emission Isolation Flux Chamber and appropriate sample collection/analysis techniques for assessing the flux of PM10 precursors from different components of representative dairy operations. The focus of this study is to collect the data needed to estimate PM10 precursor emissions and to collect information describing typical dairy operations in order to estimate PM10 precursor emissions from dairies.

The field testing was conducted in accordance with the Quality Assurance Project Plan (QAPP) entitled **"Measurement of Ammonia and PM10 Precursor Emissions from Livestock Wastes in the South Coast Air Quality Management District,"revised draft #3- 09/15/95.** The QAPP provides the field sampling and analytical protocols and describes the quality assurance, data reduction, and emission estimation procedures used to evaluate ammonia and VOC emissions from the dairy industry.

This memorandum includes a discussion of the testing methodology, quality control procedures, results, discussion of the results, and summary statements.

Pretest: record data every 6 min
total 30 min (5 data/SITE)
Sample: at 2 liter/min rate



II. TEST METHODOLOGY

Testing was conducted using the EPA recommended Surface Isolation Flux Chamber (flux chamber) as the emission assessment tool to collect emissions data. The primary reference for this section is the document entitled "Measurement of Gaseous Emission Rates From Land Surfaces Using an Emission Isolation Flux Chamber, Users Guide." EPA Environmental Monitoring Systems Laboratory, Las Vegas, Nevada, EPA Contract No. 68-02-3889, Work Assignment No. 18, February 1986.

The operation of the flux chamber is given below:

1) Flux chamber, sweep air, sample collection equipment, and field documents were located on-site and at the test location.

2) The site information, location information, equipment information, date, and proposed time of testing were documented on the Emissions Measurement Field Data Sheet.

3) The exact test location was selected and the chamber was placed in the livestock waste surface about 1/4". The thermocouples were placed in order to monitor soil/air temperature inside and air temperature outside of the chamber. (Temperature data are used to show that the emission event was not disturbed during the measurement or to correlate emission rate to temperature).

4) The sweep air flow rate was initiated and the rotometer was set at 5.0 liters per minute. Constant sweep air flow rate was maintained throughout the measurement.

5) The chamber was operated at 5.0 liters per minute and data were recorded every residence time (6 minutes) for five residence times or 30 minutes. The sample line was continuously purged intermittently with a hand pump.

6) At steady-state (greater than 5 residence times or more), gas samples were collected in evacuated stainless steel canisters and tedlar bags. Samples were collected at a rate of about 2 liters per minute. This prevented unwanted entraining of ambient air.

7) After sample collection, all samples were labeled and documented on the data sheet.

8) After labeling, all samples were properly stored as appropriate.

9) Sample collection was documented in the field master log book.

10) After sampling, the flux measurement was discontinued by

shutting off the sweep air, removing the chamber, and securing the equipment.

11) Sampling locations were labeled with sample I.D. numbers and the surface area was estimated (square meters).

12) Sample equipment was then relocated to the next test location and steps 1) through 11) were repeated.

Field screening identified unique surface areas of a dairy where PM10PC emissions were possible. These unique areas were included in the sampling strategy and are described below.

MILK COW/DRY COW CORRAL, FULL SUN DRY MANURE The corral is the location where milk cows reside when not being milked (most of the time) and dry cows reside when not in pasture (if pasture is available). The milk cow corrals are large, typically 5,000 to 11,000 m2 for milk cows and smaller for dry cows. Most of the surface area in the corrals are exposed to the sun and are covered with 1"-to-6" of dry manure. As the corral is populated with fresh manure, the fresh manure drys quickly and is soon pulverized into dry, unconsolidated manure. Other unique surface areas in the corrals include: shade area (or over-head water spray lines for cow temperature control), feeder area, water trough area, and thicker manure area. The corrals are scraped clean one or more times per year. Representative areas of dry manure (full sun) were sampled in both milk and dry cow corrals at each dairy tested. The surface area of the corrals tested were estimated by subtracting all other unique surface area estimates from the gross dimensions of the corrals tested.

MILK COW/DRY COW CORRAL SHADE AREA All milk cow corrals sampled and most dry cow corrals sampled had overhead awnings for shade. The dimensions of the awnings were measured and reported as the surface area of the shade per corral.

MILK COW/DRY COW CORRAL FEEDER AREA All corrals tested used feed lanes with head-gates for cow feeders. Typically, one side of a corral along a center alley was constructed with feeders. Most feed lanes were cement lined and generally were about 15' wide. The surface area of the wet manure (moisture possibly from water trough, fresh manure with higher moisture content, and urine) was estimated as a strip 9' wide in the lane for the length of the feed lane. Only 9' of the lane was used in the surface area estimate because the first 6' of the lane typically had little or no manure (head end).

MILK COW/DRY COW CORRAL WATER TROUGH AREA All corrals were equipped with automatic water troughs for cow watering. It was typical to find areas around the water trough with moist manure.

The manure can be wet from urine and fresh manure (since the areas are often visited by cows) and water from the trough (either leakage or cow activity in the trough). Moist manure surface around water troughs was variable and was estimated per corral tested.

MILK COW/DRY COW CORRAL THICK MANURE AREA All corrals had areas with thicker layers of manure. Thick layers in corrals may have been the result of scraping the feed lane or may be associated with manure removal practices. Thick manure layer surface area were estimated per corral tested. Measurements were made on undisturbed thick areas representing the emission characteristic for most of the time, and on disturbed thick manure representing manure as it is handled.

MILK COW/DRY COW CORRAL FRESH MANURE AREA Fresh manure was tested as a unique surface area per corral. The surface area of fresh manure was estimated by observing the frequency of cow defecation and the size of fresh manure areas. The procedure for estimating this surface area is provided in Table 3 and is meant to be an approximation for a surface found in the corrals tested. This source is insignificant compared to other sources.

DAIRY RINSATE All dairies are required by law to wash cows prior to milking to remove manure from the cow udder. Rinsate is channeled typically by surface drains and subsurface sewers to liquid storage ponds. One dairy had an open area where rinsate could be tested prior to entry into the sewer system. The rinsate was tested and the surface area of the rinsate was estimated.

LIQUID STORAGE PONDS Liquid storage ponds store the liquid waste from the milk parlor where the liquid is lost by evaporation or is used to irrigate pasture. All ponds were tested at one location by suspending the flux chamber from a small boom arrangement. The surface area of the ponds was measured at the time of testing. The volume of liquid in the ponds and thus surface area is dependent on the time of year (evaporation rate) and the water use demand.

STOCKPILES OUTSIDE OF CORRALS Stockpiles outside of corrals were common to the dairies tested. The use of stockpiles, and also the size and age of stockpiled manure, is dependent on the economics of manure removal. Most dairies clean corrals twice per year: spring, when manure is dry enough to handle; and fall, in preparation for winter. Most dairies prefer not to stockpile out of the corral since this means that the manure will have to be handled twice versus once (ie., twice the cost). Measurements were made on undisturbed stockpiles representing the emission characteristic most of the time, and on disturbed stockpiles representing manure as it is handled.

DAIRY PASTURE A few dairies have pasture. Pasture is typically irrigated using milk parlor rinsate and fertilized using stockpiled waste. Cows also fertilize pasture as they graze. Pastures were encountered and tested at two dairies. The surface area of the pasture was estimated at the fenceline.

Unique surface areas identified were tested as described in the QAPP (Table 1A for summer and Table 1B for winter). Actual data capture is shown in Tables 2A and 2B. Testing at all of the target locations was not possible (source not available) and additional testing was conducted at a few locations in order to improve data quality. Actual sample numbers are provided in Tables 2A and 2B and data can be identified in the data base using these codes. Information regarding the sources tested is provided in Tables 3A and 3B. Area source, number of cows per source, and surface area per source tested are provided along with back-up information regarding these data (see footnotes). Data from Tables 3A and 3B were used in the PM10PC emission calculations.

An important component of the testing program was a study designed to determine the variability in PM10PC emissions, specifically ammonia, over a 24-hour time period. During the summer test event, a small area of a milk cow corral was walled-off in the corner of the corral near the feed lane. The manure layer was typical of feed lane emissions. Testing was conducted at the exact same location so that ammonia flux could be measured as a function of time without spatial variability. Data were extrapolated between the hours of testing to obtain hourly flux data. These data were averaged and then used to develop normalization factors to adjust all field data to the 24-hour study data average. Normalization of field data provides for the best average emission factor data since the 24-hour cycle of emissions is properly accounted for.

Sample collection included a system blank testing at the onset of the program and during the field test. Replicate samples were collected throughout the program. System blanks were performed as the field samples are collected following the EPA protocol, however, the chamber was placed on a clean, teflon surface. The source of compounds found in the blank samples can be the sweep air gas (rated quality at <0.01 ppmv VOCs as methane), the teflon tubing, and the flux chamber. The levels of compounds found in the system blank samples were used to qualify the field sample data. Replicate sample collection and analysis were used to determine the overall system precision, which includes sampling and analytical variability. Replicate field samples were collected from the flux chamber at equilibrium conditions by collecting a second sample in a second chamber at the sample location.

The locations for testing were selected by representatives from the SCAQMD, the Milk Producers Council, and Dr. CE Schmidt. A listing of sampling locations and description of locations is provided in Tables 3A and 3B and described below.

Samples were analyzed by AIR TOXICS LIMITED of Folsom, California (all compounds except amine compounds) and DATA CHEM LABORATORIES of Salt Lake City, Utah (amine compounds).

III. QUALITY CONTROL

Quality control procedures that were used to assure quality data are listed and described below. The application and frequency of these procedures were developed to meet the program objectives and the data quality objectives. Quality control data are presented per test event.

SUMMER TESTING EVENT

- Field Documentation -- A field notebook with data forms complete with sample chain-of-custody was maintained for the testing program. (See Attachment A for a copy of the data forms and Attachment B for a copy of the sample chain-of-custody log).

- Laboratory Blank Analysis -- Laboratory blank analysis indicated acceptable method performance for all methods.

- Field Blank Samples -- A field blank sample was obtained by placing the clean chamber on a clean Teflon surface. The chamber was operated as described and blank samples for all media were collected and submitted for analysis. A total of five blanks were collected for ammonia analysis and one set of blank samples for speciation analysis.

  OSHA ID-188 for Ammonia- A total of five blanks were collected for ammonia analysis. The system blank samples showed ammonia concentrations ranging from below detection limit (<0.071 ppmv) to 1.1 ppmv. One of the samples (1.1 ppmv) did not represent chamber blank levels due to air infiltration and was discounted. The other samples showed a background level of less than detection limit (0.29 to 0.071 ppmv). These data represent acceptable method performance.

  TO-14 for VOCs- The field blank sample showed two compounds detected above method detection limit; acetone at 4.2 ppbv, and ethanol at 54 ppbv. TNMHC was reported at 350 ppbv. These data are typical for this method and indicate acceptable method performance.

  ASTM D-5504 for Reduced Sulfur Species Compounds- The field blank sample showed no compounds detected above method detection limit. These data indicate acceptable method performance.

  EPA TO-5 for Aldehydes/Ketones- The field blank contained five compounds: formaldehyde at 16 ppbv; acetone at 3.7 ppbv; isopentanal at 4.2 ppbv; m-tolualdehyde at 2.0 ppbv; and acetaldehyde at 6.6 ppbv. This occurrence is typical for this method and indicate acceptable method performance.

EPA TO-13/SW-8270 for SVOC/Aromatic Amines- The field blank sample showed two compounds detected above method detection limit, including: di-n-butylphthalate at 6.0 ppbv, and bis(2-ethylhexyl)phthalate at 17 ppbv. This occurance is typical for this method and data indicate acceptable method performance.

NIOSH 2010 for Amines- Dimethylamine was detected in the field blank sample at a significant level above method detection limit (1,000 ppbv). Since no amines were detected in the field sample, this occurance is attributed to a trip or laboratory contamination.

- Laboratory Duplicate Analysis -- Duplicate laboratory analysis was performed by repeating the laboratory analysis. The QC criteria for laboratory precision is ±30 relative percent difference (RPD). Exceedance of criteria near the method detection limit are generally considered acceptable. These data indicated acceptable laboratory performance.

- Replicate Sample -- One replicate sample was performed for all species by collecting a second sample during a measurement at the same location. One replicate sample was collected for speciation testing and multiple replicate samples were collected for ammonia. With compound levels near method detection limits as was the case for speciated data, it is not uncommon to observe exceedance of criteria or to find occurrence of compounds without compound occurrence in the replicate sample. A total of 11 replicates were collected for ammonia. The RPD for these range from 1.2 to 47 with an average of 25. The criteria for sample precision is ±50 RPD. These precision data generally show typical sampling and analytical precision for low-level flux measurements and are acceptable.

- Method Spike Sample -- Method spike samples were performed for the following methods. The QC criteria for spike recovery is ±30%. Laboratory data indicated acceptable laboratory performance.

- Chain-of-Custody -- Sample labels and sample custody forms were completed and canister samples were executed as follows: canisters - heat and light avoidance, package for shipping, shipping by priority mail or hand delivery, analysis within 14 days. Sorbent tubes and impinger solutions were preserved in sealed containers at 4°C.

WINTER TESTING EVENT

- Field Documentation -- A field notebook with data forms complete with sample chain-of-custody was maintained for the testing program. (See Attachment A for a copy of the data forms and Attachment B for a copy of the sample chain-of-custody log).

- Laboratory Blank Analysis -- Laboratory blank analysis indicated acceptable method performance for all methods.

- Field Blank Samples -- A field blank sample was obtained by placing the clean chamber on a clean Teflon surface. The chamber was operated as described and blank samples for all media were collected and submitted for analysis. A total of six blanks were collected for ammonia analysis. The system blank samples showed ammonia concentrations ranging from below detection limit (<0.57 ppmv) to 4.5 ppmv. Three of the samples did not represent chamber blank levels due to air infiltration and were discounted. The average of the other samples showed a background level of about 0.58 ppmv (near detection limit values). These data represent acceptable method performance.

- Laboratory Duplicate Analysis -- Duplicate laboratory analysis was performed by repeating the laboratory analysis. The QC criteria for laboratory precision is ±30 relative percent difference (RPD). A total of 9 laboratory replicate pairs were reported with a relative percent difference (RPD) range of 0-to-6.7; average RPD of 4.8 These data indicated acceptable laboratory performance.

- Replicate Sample -- Replicate sample collection was performed by collecting a second sample during a measurement at the same location. Six replicate pairs were collected and analyzed for ammonia. The RPD for these samples ranged from 0-to-83 with an average RPD of 27%. These precision data generally show typical sampling/analytical precision for low-level flux measurements and are acceptable.

- Chain-of-Custody -- Sample labels and sample custody forms were completed and canister samples were executed as follows: canisters - heat and light avoidance, package for shipping, shipping by priority mail or hand delivery, analysis within 14 days. Sorbent tubes and impinger solutions were preserved in sealed containers at 4°C.

IV. DISCUSSION OF ANALYTICAL RESULTS

A variety of analytical methods were used to provide chemical speciation data during the first round of dairy testing. The methods used for this program were as follows:

Target Analyte(s)	Method
Ammonia OSHA ID-188	
Volatile Organic Compounds	EPA TO-14
Semi-volatile organics/Aromatic Amines	EPA TO-13/SW-8270
Amines	NIOSH 2010
Aldehydes and Ketones	EPA TO-5
Reduced Sulfur Species	ASTM D-5504

1. Ammonia Measurements

In order to obtain both rapid on-site screening data and accurate laboratory data, two methods were used for ammonia sampling and analysis. The screening method consisted of a colorimetric sorbent tube (Sensidyne) through which a known volume of air is pulled with a hand pump. The ammonia in the air reacts with an acidic compound coated on a solid matrix to form the ammonium salt, causing a change in the pH of the coating. The amount of ammonia is proportional to the change in a colored pH indicator. Three types of colorimetric screening tubes were used for the various concentration ranges of ammonia encountered.

The laboratory method consisted of using OSHA ID-188, sampling into sorbent tubes containing sulfuric acid coated charcoal beads followed by ion chromatography of the desorbed ammonium sulfate. The sampling volume was controlled by using calibrated sampling pumps.

A comparison of the screening values with the laboratory values shows that the colorimetric screening tubes had an overall positive bias of approximately 19%. Table 4 contains the comparison data. This table shows that there is no consistency of the bias between the two methods, including the three concentration ranges of the screening tubes. (Note- Colormetric tube data were not used to quantify ammonia, only to assist in execution of sample collection for quantitative methods.)

Figures 1 and 2 are a scatter-plots of the two ranges (0-1000 ppmv--all data, and 0-10 ppmv only) of the screening data compared to the laboratory data. These plots show that the scatter between the two methods is not dependent upon concentration, although the few higher points do indicate some tendency towards a negative bias.

From a total of 121 samples collected during the summer testing event, only five were non-detect, which suggests the sampling volume combined with the analytical detection limit were sufficient to provide a high level of data capture.

The overall evaluation of the screening method in comparison to the laboratory data shows that as implied, the screening method provides a lower data quality. Its use is valuable for assistance in making field decisions, but it cannot be used for quantitative measurements.

The laboratory method performed as expected, with acceptable precision and accuracy.

2. Volatile organic compounds were sampled and analyzed using EPA Compendium Method TO-14, which consisted of sample collection using Summa canisters with subsequent GC/MS analysis. The target analyte list consisted of the Air Toxics Limited "extended TO-14 list" (the standard 39 TO-14 analytes plus an additional ~20 non-target species, including several polar compounds) plus analysis for the top ten tentatively identified compounds (TICs). In addition, a summation of the total ion current count was referenced to hexane to give a value for total non-methane hydrocarbons (TNMHC). The resultant detection limits (on a sample-specific basis) typically ranged from 0.7 ppbv to 3.0 ppbv for chemical species and 7.0 to 7.5 ppbv for TNMHC.

Several target compounds were detected at levels well above the method detection limit. Several TICs were detected, some of which were identifiable only as "unknown hydrocarbons" due to their low match probability with library reference spectra. The TNMHC values did not agree well with the sum of species, which indicates that the species detected are only a fraction of the total organics present. This is not a concern because TNMHC is not a significant parameter for monitoring in this program, and TNMHC by summation from TO-14 is often the least conservative method for measuring TNMHC. The remaining species were probably present at levels below individual detection limits and therefore were not quantified.

The net performance of the canister method confirms the earlier work that showed satisfactory performance for volatile organic compounds, including hydrocarbons.

3. Semi-volatile Organic Compounds

Semi-volatile organic compounds were sampled using a combination of EPA Method TO-13 and EPA Method SW-8270. The sampling media consisted of XAD-2 resin and polyurethane foam plug. The sorbent is extracted and analyzed by GC/MS. The target compounds included the full scan list from method SW-8270. In addition, aromatic amine compounds were included in the analysis as tentatively identified compounds. This approach allowed the detection of another group of target analytes (aromatic amines) without having to sample separately for that group. Aliphatic amines were sampled using NIOSH 2010, which is discussed below.

Only a few semi-volatile organic compounds were detected in these samples. One compound--bis(2-ethylhexyl) phthalate--was detected in three of the samples, and can be considered a media contaminant. This compound is frequently present in samples that are extracted, and unless present at a very high level, is dismissed as a background contaminant.

No other semi-volatile target species were present in the summer test data and low levels of naphthalene and bi-n-butylphalate were found at low levels in the single winter test sample.

Several aromatic amines were present, including several classified as "unidentified" due to poor library matches. Although these amines were detected, the accuracy of these values is unknown due to the lack of information on their recovery from the sampling media and extraction process. Therefore, these values can be considered only lower limits of quantitation. Considering the amounts detected, the high quantity of nitrogen present in the manure being sampled and the probability of at least some loss in sample handing, it is probable that the actual amount of these compounds is higher than shown in the data tables. However, substantial additional analytical method validation would have to be conducted to increase the certainty on these measurements.

The detection limit for the target species was approximately 25 ug/m3. Given the probability of semi-volatile organic compounds being present, this detection limit appears to be inadequate. However, balancing the time required for sampling with the probable value of the data obtained, a limited amount of testing for subsequent rounds is suggested to provide assurance of comparability between data sets.

The data from the previous North California study confirms the conclusion obtained from the present data set.

4. Amines

Amines were sampled using NIOSH Method 2010. No compounds were detected from this method. It is probable that this was due primarily to a detection limit question rather than applicability of the method. Unless the sample volume is increased substantially, it is probable that no amines will be detected in future samples. However, it is recommended that the comparability of the data set be established, as mentioned above in conjunction with the aromatic amines, by conducting at least one sampling for amines during the second round of measurements.

5. Aldehydes and Ketones

Aldehydes and ketones were sampled and analyzed using EPA Method TO-5 in which the sample was drawn through impingers filled with acidified dinitrophenyl hydrazine. The reaction product--the hydrazone--is analyzed by high performance liquid chromatography. A number of target species were detected in these samples. Data for acetaldehyde and acetone were qualified from several samples due to blank contamination. Comparability between canisters and TO-5 is poor due to uncertainties in the canister analysis for these compounds and because of uncertainties in the efficiency of the TO-5 sampling method.

However, for key aldehyde species such as formaldehyde, the method is well validated and suitable for the present study.

6. Reduced Sulfur Species

The flux chamber samples for reduced sulfur species were collected into Tedlar bags, shipped immediately to the laboratory for analysis using gas chromatography with chemiluminescence detection. This approach is superior to most methods in that it is more sensitive to the target species and less susceptible to matrix interference.

The speciated target compound data are reported in Tables 5A/B through 19A/B but has not been entered into a database or used to estimate PM10PC emission factors. Speciated target compound information has been reported in order to confirm that ammonia is the dominant PM10PC. Full reporting is provided in Tables 5 through 13 by analytical method. Compounds (other than ammonia) reported above method detect limit by location are provided in Tables 15 through 19. This presentation allows for rapid identification of only those compounds detected at all locations. All field data are summarized as concentration data (ppbv and/or ug/m3) and flux data (ug/m2,min-1). Emission factors can be calculated for these compounds if desired by normalizing the location specific flux data as per time of day (see below), multiplying normalized flux by source surface area, and dividing the unit process by the cows reported per unit process to develop unit specific emission rate data. These data can then be used to estimate compound specific emission per dairy and a dairy "emission factor per cow" estimate by knowing the total number of cows per dairy. Normalization factors were used for all corrals and stockpiled manure, but were not used for rinsate, pond, or disturbed manure emission estimates.

Several target species were detected in a few samples at quantifiable levels. These data suggest that the method is satisfactory for this type sampling.

Data were collected on a typical late summer days in the Chino Basin and weather conditions were typical of late summer conditions (sunny/partly cloudy, light winds, mild temperatures). No rain was reported.

IV. DERIVATION AND DISCUSSIONS OF EMISSION FACTORS

The results of the analysis of the samples collected from the emissions measurements are given in Attachment C. Analytical method detection limits for target compounds are reported on each sample analysis report.

Emission rate data are calculated by using measured target compound concentrations and flux chamber operating parameter data (sweep air flow rate 5.0 liters per minute, surface area 0.13 m^2). The emission rate of species, ERi (micrograms per minute per square meter), is calculated by knowing the sweep air flow rate, Q (cubic meter/ minute), species concentration Yi (micrograms/cubic meter), and exposed (to the chamber) surface area A (square meter) as follows:

$$ERi = \frac{Q \cdot Yi}{A} \qquad \text{EQUATION 1}$$

The data set has been divided into to sets: speciated target compound flux data, and ammonia flux data. Ammonia concentration data (Attachment C) are reported by location (per dairy) and normalized using the 24-hour control point data. Diurnal flux measurements were made at one location every two hours for a 24-hour period. These data are shown in Figure 3 and listed in Table 20. Normalization factors were developed by averaging the 24-hour data, interpolating data between the 2-hour spaced measurement data for hourly data, and then dividing the average value by the hourly value. These data (given in Table 20) were used to adjust all field data (summer and winter) as shown in Tables 21A and 21B for diurnal variation so that all data would better represent daily average data. Normalized ammonia data provided in Attachment C were then used for calculating emission rate factors as described below. Normalized ammonia flux data (normalized concentration data calculated as flux by Equation 1) were multiplied by the estimate of surface area for each source and reported as emissions (ug/m2) in Table 22.

Diurnal variation was also examined during winter conditions, however a different approach was used. Control data were collected at selected locations in milk and dry corrals, feed lanes, and in-corral thick manure areas by retesting at one or more times per day during one day. A total of 10 locations were tested as control points and ammonia emissions were normalized assuming the normalization approach was valid for winter data. Adherence to the diurnal variation was tested by calculating the percent relative standard deviation from these 10 data sets. The percent relative standard deviation ranged from 17-to-72 with and average of 36. These data suggest that a similar phenomena was occurring during the winter season, and the normalized the winter data set using the summer normalization factors is valid.

The sources tested were well understood, representing the actual number of cows per source. This allowed for the calculation of representative unit specific (ie., large dairy #1, milk cow corral, shade area) emission rate data per cow for a given "unique" surface area. These data were obtained by dividing unit source emission rate data (averaged and summed per source type) by number of cows per unit. As shown in Tables 23A and 23B, emissions data were calculated per cow per source and used to estimate emissions per source category to calculate dairy emissions. Said another way, point specific flux representing areas were used to calculate emissions per source, and then source emissions were used to calculate an interim emission factor on a "per cow basis" per source. Since the emission per source category was measured accurately and the number of cows per source was known, the best use of these data was to estimate total dairy emissions using the interim per cow estimate to calculate dairy emissions.

There were three categories of estimate: milk cows per dairy, dry cows per dairy, and community property (eg., ponds, stockpiles, pastures, rinsate). As shown in Tables 23A/B, this approach produced an ammonia emission estimate per dairy, and, by dividing this estimate representing all significant sources per dairy by the <u>total number of cows</u> (milk and dry cows), an emission factor per cow per year for each dairy tested was obtained. The variability in the estimate is shown in the comparison of <u>interim per cow ammonia emission estimates</u> as provided in Tables 24A and 24B.

Note that total dairy or community sources such as out of corral stockpiles, ponds pasture, and rinsate, use the total number of dairy cows in the "per cow" ammonia emission rate estimate. The advantage to using this approach for emission factor development is that only one significant assumption is made; at a given dairy, corral population and operations per corral are consistent from corral to corral. If this assumption is true, this approach to developing emission factors is the best use of measured flux data.

Final data in Tables 25A and 25B include dairy emissions (which have no global significance), and per cow emission factors. The dairy emission estimates for Large dairies #1 and #2 and Small dairies #1 and #2, summer season, are: 29,000, 41,000, 14,000, and 20,000 pounds ammonia per year. More importantly, the **per cow** dairy emission estimates for Large dairies #1 and #2 and Small dairies #1 and #2, which are again generated by dividing these annual emission estimates by total cows per dairy, are: 19, 21, 39, 20 pounds per year per cow. The outlier, 39 pounds per year, has been determined to be non-representative from site survey data. Small dairy #1 **is not representative** because it was recently reduced in number of cows from over 1,200 to 360. The dairy corrals and common areas were laden with manure and only a fraction of the cows that were in the corrals were in corrals during testing and used in the calculation. Thus, the estimate is biased high. An average of per cow emissions using both large dairies and the remaining small dairy provides for the annual average emission factor of 20 pounds per cow for summer conditions. Likewise, the winter emission factor was calculated per each dairy tested, namely: 9.7, 8.8, 9.4, and 14 pounds per cow for an average winter months emissions of 11 pounds per cow per year.

The small variability between these per cow seasonal estimates supports the data usage approach and is accounted for by the following observations:

1) The dairies tested are similar in design, especially in the ratio of size of corrals to number of cows. The corral size and number of cows in each corral appear to be optimized in the basin based on operational considerations.

2) Cow feed (alfalfa based feed) appeared similar at the dairies tested.

3) Representative test data were generated by first screening unique sources and identifying areas of similar emissions potential per source (ie., milk cow corral- dry manure, feeder, water trough, thick area). Multiple testing per source was then conducted using random sampling.

5) A significant database was generated which included a full characterization at each of the five dairies tested.

VI. SUMMARY

Flux measurements of study compounds were measured from various area sources at four dairies in Southern California with those late summer/early fall meteorological conditions experienced on September 26 through October 7, 1995 and winter conditions experienced on December 11 though 14, 1995. The following summary statements are provided:

- o Emission rates of ammonia and VOCs were measured at the ground surface using the EPA recommended surface isolation flux chamber technology and verified sample collection and analytical methods. This technology quantitatively measures emission rates from an emitting surface.

- o Laboratory blank data, duplicate laboratory analysis data, trip blank data, and method spike quality control data (Attachment C) indicate acceptable laboratory performance by the project laboratories for these methods.

- o Field blank data, trip blank data, and replicate sample quality control data (Attachment C) indicate acceptable sampling method performance.

- o The summer conditions emission rate estimate for ammonia is 20 pounds per year per cow and the winter conditions emission rate estimate for ammonia is 11 pounds per year per cow.

- o Assuming a year is represented by 3 months of winter conditions and 9 months of summer conditions, a hypothetical annual average emission rate estimate for ammonia could be calculated such as 18 pounds per year per cow (e.g., 20(9/12)+11(3/12)=18). A representative annual estimate would require a detailed meteorological analysis and use of these seasonal per cow emission data accordingly.

- o Data from EPA Method TO-14 for volatile organic compounds showed infrequent and low levels of VOC flux, including: chloromethane, methylene chloride, cis-1,2-dicloroethene, 1,1,1- thrichloroethane, benzene, trichloroethene, toluene, m,p-xylenes, 1,2,4-trimethylbenzene, propylene, acetone, carbon disulfide, 2-propanol, 2-butanone, 4-methyl-2-pentanone, ethanol, and 1-butanol. The VOC reported at the highest flux (other than TNMHC) was propylene (11 ug/m2,min-1). The source with the highest flux was a disturbed stockpile. Note that some of these VOC compounds such as chlorinated compounds and benzene observed at low levels are also commonly found in urban background flux measurements. The source of these compounds may be due to adsorption of VOCs from regional ambient air and may not be related to the livestock waste directly. Low level detections (near method detection limit) may not represent air emissions from livestock waste.

- Data from ASTM D-5504 for sulfur (reduced) containing compounds showed infrequent and low levels of compound flux, including: hydrogen sulfide, carbonyl sulfide, methyl mercaptan, dimethyl sulfide, carbon disulfide, and 2,5-dimethylthiophene. The compound reported at the highest flux was dimethyl sulfide (2.4 ug/m2,min-1). The source with the highest flux was a milk cow corral, dry random.

- Data from EPA Method TO-5 for carbonyl compounds showed detection of a few compounds at low levels, including: formaldehyde, acetaldehyde, acetone, propanal, acetone, isobutylaldehyde/methyl ethyl ketone, benzaldehyde, isopentanal, m/p- tolualdehyde, and hexanal. The carbonyl compound reported at the highest flux was formaldehyde (120 ug/m2,min-1). The source with the highest formaldehyde flux was a milk cow corral, dry random. Note that carbonyl compounds were often found in project blank samples at low levels and these data were not used to qualify the field data.

- Data from EPA Method TO-13/SW-8270 for semi-volatile compounds (SVOCs) and aromatic amine compounds showed detection of a few compounds at low levels, including: bis(2-ethylhexyl)phthalate, 4-methyl-1,2-benzenediamine, 2-methyl-1,3-benzenediamine, 7-methyl-1,2,4-triazolo(4,3-a)pyridin-3-amine, naphthalene, and unknown aromatic amines . The SVOC compound reported at the highest flux was bis(2-ethylhexyl)phthalate (23 ug/m2,min-1). The source with the highest SVOC flux was a liquid storage pond. The aromatic amine compound reported at the highest flux was 2-methyl-1,3-benzenediamine (12 ug/m2,min-1). The source with the highest aromatic amine flux was a milk cow corral, water trough area. Note that bis(2-ethylhexyl)phthalate was found in project blank samples at low levels and these data were not used to qualify the field data.

- No aliphatic amine compounds were detected above method limits by NIOSH Method 2010.

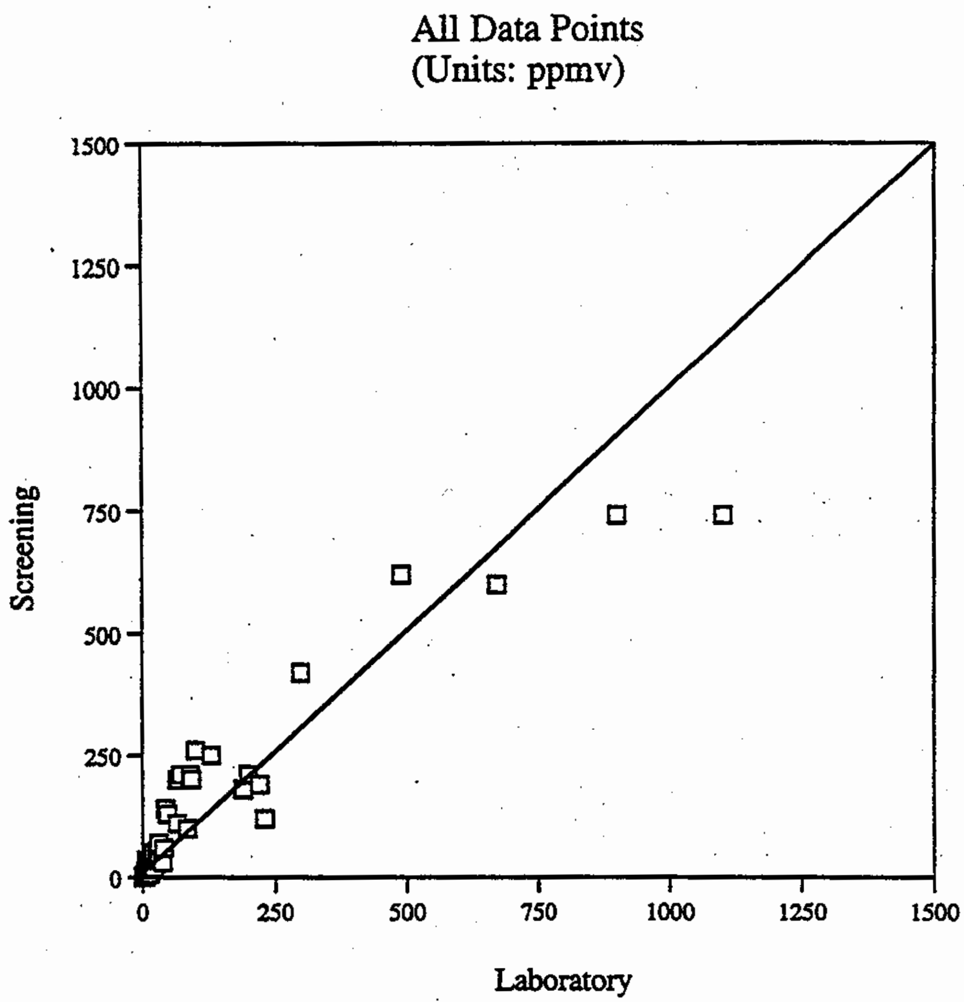


FIGURE 1. SCATTER-PLOT SHOWING CORRELATION BETWEEN SCREENING AND LABORATORY AMMONIA DATA (ALL DATA).

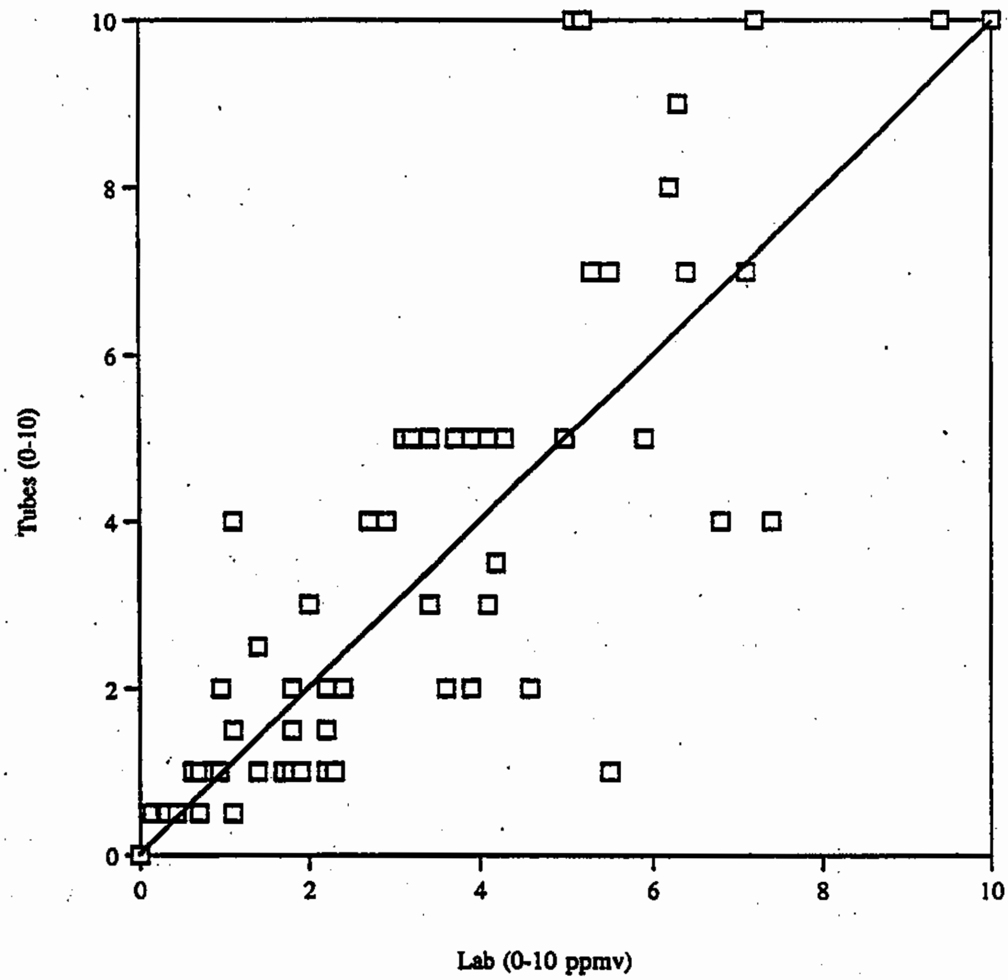


FIGURE 2. SCATTER-PLOT SHOWING CORRELATION BETWEEN SCREENING AND LABORATORY AMMONIA DATA (1-10 PPMV).

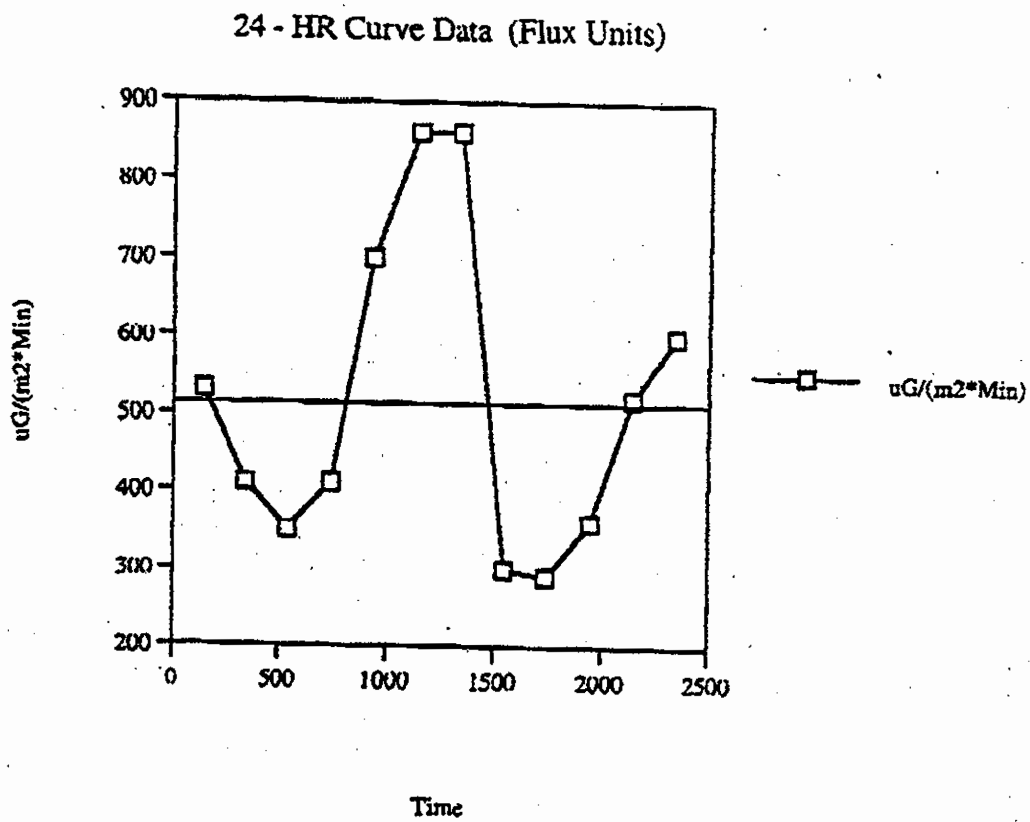


FIGURE 3. PLOT SHOWING 24-HOUR AMMONIA FLUX DATA VERSUS TIME.

TABLE 1A. SAMPLING PLAN FOR DETAILED TESTING - SUMMER TEST

AREA SOURCE	CONDITION	LG #1	LG #2	SM #1	SM #2
DRY LOT CORRAL- MILK COW, FULL SUN	DRY, RANDOM	6/1	3	6/1	3
DRY LOT CORRAL- MILK COW, SHADE	DRY, RANDOM	1	1	1	1
DRY LOT CORRAL- MILK COW, FEEDER AREA	TYPICALLY MOIST	1	1	1	1
DRY LOT CORRAL- MILK COW, WATER TROUGH	TYPICALLY MOIST	1	1	1	1
DRY LOT CORRAL- MILK COW, STOCK PILE	UNDISTURBED, THICKEST	1	1	1	1
DRY LOT CORRAL- MILK COW, STOCK PILE	DISTURBED	1	1	1	1
DRY LOT CORRAL- MILK COW, DIURNAL TESTING, 24-HOURS	ONE LOCATION, EVERY 2-HOURS	12	0	0	0
DRY LOT CORRAL- MILK COW, FRESH MANURE	VERY FRESH	1	0	0	0
DRY LOT CORRAL- DRY COW, FULL SUN	DRY, RANDOM	6/1	3	6/1	3
DRY LOT CORRAL- DRY COW, SHADE	DRY, RANDOM	1	1	1	1
DRY LOT CORRAL- DRY COW, FEEDER AREA	TYPICALLY MOIST	0	0	0	0
DRY LOT CORRAL- DRY COW, WATER TROUGH	TYPICALLY MOIST	0	0	0	0
DRY LOT CORRAL- DRY COW, FULL SUN	UNDISTURBED, THICKEST	1	1	1	1
DRY LOT CORRAL- DRY COW, FULL SUN	DISTURBED	1	1	1	1
DRY LOT CORRAL- DRY COW, FULL SUN	VERY FRESH	1	0	0	0
MILK PARLOR EFFLUENT	RINSATE	1	1	1	1
LIQUID STORAGE POND	UNDISTURB	1/1	1	1	1
STOCKPILE	UNDISTURB	3/1	1	3	1
STOCKPILE	DISTURBED	3/1	1	3	1
IRRIGATED PASTURE	GRASS	0	0	0	0
BLANK TESTS	SYSTEM	8/1			
REPLICATE TESTS	FIELD	8/1			

1ST NUMBER FLUX/AMMONIA
2ND NUMBER FLUX/AMMONIA PLUS FULL SPECIATION

TABLE 1B. SAMPLING PLAN FOR DETAILED TESTING - WINTER TEST

AREA SOURCE	CONDITION	LG #1	LG #2	SM #1	SM #2
DRY LOT CORRAL- MILK COW, FULL SUN	DRY, RANDOM	3 a,b	3	3	3
DRY LOT CORRAL- MILK COW, SHADE	DRY, RANDOM	1	1	1	1
DRY LOT CORRAL- MILK COW, FEEDER AREA	TYPICALLY MOIST	1 b	1	1	1
DRY LOT CORRAL- MILK COW, WATER TROUGH	TYPICALLY MOIST	1	1	1	1
DRY LOT CORRAL- MILK COW, STOCK PILE	UNDISTURBED, THICKEST	1	1	1	1
DRY LOT CORRAL- MILK COW, STOCK PILE	DISTURBED	1	1	1	1
DRY LOT CORRAL- MILK COW, FRESH MANURE	VERY FRESH	1	1	1	1
DRY LOT CORRAL- DRY COW, FULL SUN	DRY, RANDOM	3 b	3	3	3
DRY LOT CORRAL- DRY COW, SHADE	DRY, RANDOM	1	1	1	1
DRY LOT CORRAL- DRY COW, FEEDER AREA	TYPICALLY MOIST	1 b	1	1	1
DRY LOT CORRAL- DRY COW, WATER TROUGH	TYPICALLY MOIST	1	1	1	1
DRY LOT CORRAL- DRY COW, FULL SUN	UNDISTURBED, THICKEST	1	1	1	1
DRY LOT CORRAL- DRY COW, FULL SUN	DISTURBED	1	1	1	1
DRY LOT CORRAL- DRY COW, FULL SUN	VERY FRESH	1	1	1	1
MILK PARLOR EFFLUENT	RINSATE	0	0	0	0
LIQUID STORAGE POND	UNDISTURB	1	1	1	1
STOCKPILE	UNDISTURB	3	3	3	3
STOCKPILE	DISTURBED	3	3	3	3
IRRIGATED PASTURE	GRASS	1	1	1	1
BLANK TESTS	SYSTEM	6			
REPLICATE TESTS	FIELD	6			

a- FULL SPECIATION
b- CONTROL POINT TESTING: 0700/1000/1600

TABLE 2A. ACTUAL SAMPLING PLAN FOR DETAILED TESTING - SUMMER TEST

AREA SOURCE	CONDITION	LG #1	LG #2	SM #1	SM #2
DRY LOT CORRAL- MILK COW, FULL SUN	DRY, RANDOM	N005 N009 N011 N014 N015 N016 C002/C003 T002/T003 F002 A002 S002	N098 N100 N103 N104	N050/N051 N053 N057 N064/N065 N066 N067 C008 A008 T008 S008	N116 N118 N119
DRY LOT CORRAL- MILK COW, SHADE	DRY, RANDOM	N010 N012	N095/N096	N052	N114
DRY LOT CORRAL- MILK COW, FEEDER AREA	TYPICALLY MOIST	N002	N101/N102	N058/N059	N112
DRY LOT CORRAL- MILK COW, WATER TROUGH	TYPICALLY MOIST	N003	N105	N054/N055 N061*	N113
DRY LOT CORRAL- MILK COW, STOCK PILE	UNDISTURBED, THICKEST	N004	N097	N060	N115
DRY LOT CORRAL- MILK COW, STOCK PILE	DISTURBED	N006/N007	N099	N063	N117
DRY LOT CORRAL- MILK COW, DIURNAL TESTING, 24-HOURS	ONE LOCATION, EVERY 2-HOURS	NONE	NONE	N039 N040 N041 N042 N043 N044 N045 N048 N053 N056 N067 N068 N069 N083	NONE
DRY LOT CORRAL- MILK COW, FRESH MANURE	VERY FRESH	N008	NONE	NONE	NONE
DRY LOT CORRAL- DRY COW, FULL SUN	DRY, RANDOM	N017 N023 N024 N026 N027/N028 C004 T004 A003 S003/S004 F003	N085 N088/N089 N093/N094	N070 N078 N079 N081 N082 F009 A010 S010 C010 T009	N124 N125 N127
DRY LOT CORRAL- DRY COW, SHADE	DRY, RANDOM	N018	N086	N076	N123
DRY LOT CORRAL- DRY COW, FEEDER AREA	TYPICALLY MOIST	N022	N092	N075	N126
DRY LOT CORRAL- DRY COW, WATER TROUGH	TYPICALLY MOIST	N020	N090	N074	N121
DRY LOT CORRAL- DRY COW, FULL SUN	UNDISTURBED, THICKEST	N019	N087	NONE	N120
DRY LOT CORRAL- DRY COW, FULL SUN	DISTURBED	N021	N091	NONE	N122
DRY LOT CORRAL- DRY COW, FULL SUN	VERY FRESH	N025	NONE	NONE	NONE
MILK PARLOR EFFLUENT	RINSATE	N030	NONE	NONE	NONE

TABLE 2A. (CONTINUED)					
LIQUID STORAGE POND	UNDISTURB	N029 C005 T005 S005 F004 A004	N084	N077	N130
STOCKPILE	UNDISTURB	NONE	N106 N107 N108	N035 N036 N046 N049 T006 C006 A005/A006 S006 F005	N128
STOCKPILE	DISTURBED	NONE	N109 N110 N111	N037 N038 N047 T007 C007 A007 S007 F006/F007	N129
IRRIGATED PASTURE	GRASS	NONE	NONE	N080	NONE
BLANK TESTS	SYSTEM	T001 N001 C001	A001 N033/N034	F001 S001	N031/N032
REPLICATE TESTS	SYSTEM	C002/C003 T002/T003 N005/N007 S003/S004 N031/N032	N095/N096 N101/N102 N088/N089 N093/N094 N033/N034	N050/N051 N064/N065 N058/N059 N054/N055 A005/A006 F006/F007	NONE

* SCAQMD SPIT SAMPLE
TOTAL COUNT- AMMONIA TUBES 130, 11 REPLICATES, 5 BLANKS, 114 SAMPLES
FULL SPECIATION, 1 REPLICATE, 1 BLANK, 8 SAMPLES

TABLE 2B. ACTUAL SAMPLING PLAN FOR DETAILED TESTING - WINTER TEST

AREA SOURCE	CONDITION	LG #1	LG #2	SM #2	SM #3
DRY LOT CORRAL- MILK COW, FULL SUN	DRY, RANDOM	N310c N311 N312	N224 N323c N324 N325	N301 N302 N303	N234 N334c N335 N146* T001 C001 T-SPLIT A/B A001 F001 S001 N-SPLIT A/B
DRY LOT CORRAL- MILK COW, SHADE	DRY, RANDOM	N211	N131	N202	N336s
DRY LOT CORRAL- MILK COW, FEEDER AREA	TYPICALLY MOIST	N110/111c	N129c	N101	N236
DRY LOT CORRAL- MILK COW, WATER TROUGH	TYPICALLY MOIST	N114/115	N130	N102	N235
DRY LOT CORRAL- MILK COW, STOCK PILE	UNDISTURBED, THICKEST	N209c	N222	N200	N237
DRY LOT CORRAL- MILK COW, STOCK PILE	DISTURBED	N210	N223	N201	N238
DRY LOT CORRAL- MILK COW, DIURNAL TESTING, 24-HOURS	ONE LOCATION, EVERY 2-HOURS	NONE	NONE	NONE	NONE
DRY LOT CORRAL- MILK COW, FRESH MANURE	VERY FRESH	N112/113	NONE	N103	NONE
DRY LOT CORRAL- DRY COW, FULL SUN	DRY, RANDOM	N314 N315 N316	N220 N319c N320 N321	N304 N305 N306	N144 N330 N331 N332
DRY LOT CORRAL- DRY COW, SHADE	DRY, RANDOM	N213	N127	N205	N232s
DRY LOT CORRAL- DRY COW, FEEDER AREA	TYPICALLY MOIST	N118/119	N125c	N104	N142
DRY LOT CORRAL- DRY COW, WATER TROUGH	TYPICALLY MOIST	N120/121	N126	N106	N143
DRY LOT CORRAL- DRY COW, FULL SUN	UNDISTURBED, THICKEST	N214	N218c	N203	N230
DRY LOT CORRAL- DRY COW, FULL SUN	DISTURBED	N215	N219	N204	N231
DRY LOT CORRAL- DRY COW, FULL SUN	VERY FRESH	N122	NONE	N105	NONE
MILK PARLOR EFFLUENT	RINSATE	NONE	NONE	NONE	NONE
LIQUID STORAGE POND	UNDISTURB	N216	NONE	N208	NONE
STOCKPILE	UNDISTURB	NONE	N134 N227 N328	N107 N206 N307	N233
STOCKPILE	DISTURBED	NONE	N135 N228 N329	N108 N207 N308	NONE
IRRIGATED PASTURE	GRASS	NONE	NONE	NONE	N145 N333
BLANK TESTS	SYSTEM	N100 N109	N123 N300	N309 N317	
REPLICATE TESTS	SYSTEM	N110/111 N112/113 N114/115 N116/117 N118/119 N120/121			
CONTROL POINT TESTS	VARIABLE	N110/111 N116/117 N124 N209 N212 N217 N310 N313 N318	N125 N128 N133 N129 N132 N218 N221 N226 N222 N225 N319 N322 N327 N323 N326	NONE	N334 N337

* SCAQMD SPIT SAMPLE
C- CONTROL POINT TEST
S- WATER SPRAY AREA
TOTAL COUNT- AMMONIA TUBES 124, 6 REPLICATES, 6 BLANKS, 112 SAMPLES
FULL SPECIATION, 1 SAMPLE

TABLE 3A. SAMPLING PLAN FOR DETAILED TESTING- SUMMER TEST

AREA SOURCE	CONDITION	LG #1 AREA (m2)	LG #1 COWS	LG #2 AREA (m2)	LG #2 COWS	SM #1 AREA (m2)	SM #1 COWS	SM #2 AREA (m2)	SM #2 COWS
DRY LOT CORRAL- MILK COW, FULL SUN	DRY, RANDOM	7,620a	165	5,839o	80	6,298c'	32	11166q'	165
DRY LOT CORRAL- MILK COW, SHADE	DRY, RANDOM	334b	165	375p	80	372d'	32	1,003r'	165
DRY LOT CORRAL- MILK COW, FEEDER AREA	TYPICALLY MOIST	334c	165	259q	80	230e'	32	460s'	165
DRY LOT CORRAL- MILK COW, WATER TROUGH	TYPICALLY MOIST	208d	165	28r	80	19f'	32	37t'	165
DRY LOT CORRAL- MILK COW, STOCK PILE	UNDISTURBED, THICKEST	232e	165	697s	80	140g'	32	102u'	165
DRY LOT CORRAL- MILK COW, STOCK PILE	DISTURBED	232e	165	697s	80	140g'	32	102u'	165
DRY LOT CORRAL- MILK COW, DIURNAL TESTING, 24-HOURS	ONE LOCATION, EVERY 2-HOURS	NA	NA	NA	NA	NA	NA	NA	NA
DRY LOT CORRAL- MILK COW, FRESH MANURE	VERY FRESH	5f	165	2t	80	1h'	45	5v'	165
DRY LOT CORRAL- DRY COW, FULL SUN	DRY, RANDOM	7,897g	145	6,156u	69	4,659i'	45	3,518w'	57
DRY LOT CORRAL- DRY COW, SHADE	DRY, RANDOM	803h	145	375v	69	256j'	45	186x'	57
DRY LOT CORRAL- DRY COW, FEEDER AREA	TYPICALLY MOIST	564k	145	259y	69	631'	45	170a''	57
DRY LOT CORRAL- DRY COW, WATER TROUGH	TYPICALLY MOIST	191	145	28z	69	19m'	45	19b''	57
DRY LOT CORRAL- DRY COW, FULL SUN	UNDISTURBED, THICKEST	56i	145	93w	69	NA	45	46y'	57
DRY LOT CORRAL- DRY COW, FULL SUN	DISTURBED	56i	145	93w	69	NA	45	46y'	57
DRY LOT CORRAL- DRY COW, FRESH MANURE	VERY FRESH	4j	145	2x	69	1k'	45	2z'	57
MILK PARLOR EFFLUENT	RINSATE	42m	1,200	NA	NA	NA	NA	NA	NA
LIQUID STORAGE POND	UNDISTURB	4,450n	1,200	15000a'	2,000	4,270n'	400	2120c''	800
STOCKPILE	UNDISTURB	NA	NA	4,400b'	2,000	5,340o'	400	56d''	800
STOCKPILE	DISTURBED	NA	NA	4,400b'	2,000	5,340o'	400	56d''	800
IRRIGATED PASTURE	GRASS	NA	NA	NA	NA	80900p'	NA	NA	NA

TABLE 3A. (CONTINUED)

a - 47,000 ft2 + 47,000 ft2 = 94,000 ft2; 8,733 m2 - 334 m2 - 334 m2 - 208 m2 - 232 m2 - 5 m2 = 7,620 m2
b - 180' x 20' = 3,600 ft2; 334 m2
c - 9' x 200' = 3,600 ft2; 334 m2
d - 3 tanks: total 600 ft2; 56 m2 plus two other wet areas 600 ft2 + 1640 ft2 = 2,240 ft2; 208 m2
e - Sum of 7 areas - 2,500 ft2; 232 m2
f - 0.3 m2 per pile x no. cows/10 = (0.3 m2)(165)/10 = 5 m2
g - 49,021 ft2 + 51,554 ft2 = 100,575 ft2; 9,343 m2 - 803 m2 - 56 m2 - 4 m2 - 564 m2 - 19 m2 = 7,897 m2
h - 8,640 ft2; 803 m2
i - 600 ft2; 56 m2
j - 0.3 m2 per pile x no. cows/10 = (0.3 m2)(145)/10 = 4 m2
k - 9' x 675' = 6,075 ft2; 564 m2
l - 200 ft2; 19 m2
m - 15' x 30' = 450 ft2; 42 m2
n - 420' x 114' = 47,880 ft2; 4,450 m2
o - 74,500 ft2; 7,200 m2 - 375 m2 - 259 m2 - 28 m2 - 697 m2 - 2 m2 = 5,839 m2
p - 20' x 202' = 4,040 ft2; 375 m2
q - 9' x 310' = 2,790 ft2; 259 m2
r - 300 ft2; 28 m2
s - 50' x 150' = 7,500 ft2; 697 m2
t - (0.3 m2)(80)/10 = 2
u - 74,400 ft2; 6,911 m2 - 375 m2 - 93 m2 - 259 m2 - 28 m2 = 6,156 m2
v - 202' x 20' = 4,040 ft2; 375 m2
w - 1,000 ft2 est.; 93 m2
x - (0.3 m2)(69)/10 = 2
y - 9' x 310' = 2,790 ft2; 259 m2
z - 300 ft2; 28 m2
a'- est. 162,000 ft2; 15,000 m2
b'- 282' x 168' = 47,376 ft2; 4,400 m2
c'- 231' x 329' = 75,999 ft2; 7,060 m2 - 372 m2 - 1 m2 - 230 m2 - 19 m2 - 140 m2 = 6,298 m2
d'- 200' x 20' = 4,000 ft2; 372 m2
e'- 9' x 276' = 2,484 ft2; 230 m2
f'- 200 ft2; 19 m2
g'- 2 areas; 1,000 ft2 + 500 ft2 = 1,500 ft2; 140 m2
h'- (0.3 m2)(32)/10 = 1
i'- 366' x 147' = 53,802 ft2; 4,998 m2 - 256 m2 - 63 m2 - 19 m2 - 1 m2 = 4,659 m2
j'- 20' x 138' = 2,760 ft2; 256 m2
k'- (0.3 m2)(45)/10 = 1
l'- 9' x 75' = 675 ft2; 63 m2
m'- 200 ft2; 19 m2
n'- 16,000 ft2 + 30,000 ft2 = 46,000 ft2; 4,270 m2
o'- 250' x 230' = 57,500 ft2; 5,340 m2
p'- 4,047 m2/acre x 20 acres = 80,900 m2
q'- 570' x 240' = 137,500 ft2; 12,773 m2 - 1,003 m2 - 460 m2 - 5 m2 - 37 m2 - 102 m2 = 11,166 m2
r'- 20' x 540' = 10,800 ft2; 1,003 ft2

TABLE 3A. (CONTINUED)

s'- 9' x 550 ' = 4,950 ft2; 460 m2
t'- 400 ft2; 37 m2
u'- 200 ft2 + 100 ft2 + 100 ft2 + 200 ft2 + 200 ft2 + 300 ft2 = 1,100 ft2; 102 m2
v'- (0.3 m2)(165)/10 = 5
w'- 42,427 ft2; 3,941 m2 - 186 m2 - 46 m2 - 2 m2 - 170 m2 - 19 m2 = 3,518 m2
x'- 20' x 100' = 2,000 ft2; 186 m2
y'- 500 ft2; 46 m2
z'- (0.3 m2)(57)/10 = 2
a"- 9' x 203' = 1,827 ft2; 170 m2
b"- 200 ft2; 19 m2
c"- 60' x 380' = 22,800 ft2; 2,120 m2
d"- 20' x 30' = 600 ft2; 56 m2

NOTES:

1) Milk cow and dry cow corral dimensions were measured; dry random areas calculated by subtracting shade, feeder, water trough, fresh manure and thick areas from gross surface area.

2) Shade areas were taken as overhead projection of awning or shade area.

3) Feeder areas (moist) were estimated as a 9' wide area per linear foot of feeder.

4) Water trough areas (moist) were estimated from visual inspection of trough areas.

5) Undisturbed thick areas were estimated from visual inspection of corrals.

6) Disturbed thick areas were estimated as undisturbed thick areas.

7) Fresh manure areas were estimated as 0.3 m2 per dropping with 1/10th of cows providing a fresh dropping at any time: (0.3 m2)(No. cows/10) = fresh area m2.

8) Milk parlor rinsate area estimated from a small ponded water area near surface drain estimates of surface areas.

9) Liquid storage pond areas were measured at the time of testing, irregular shapes provide estimates of surface areas.

10) Stockpile areas measured at the time of testing. Surface roughness was not accounted for.

11) Irrigated pasture area estimated from rancher plot maps.

12) (ft2)(0.0929 m2/ft2) = (m2)

TABLE 3B. SAMPLING PLAN FOR DETAILED TESTING - WINTER TEST

AREA SOURCE	CONDITION	LG #1 AREA (m2)	LG #1 COWS	LG #2 AREA (m2)	LG #2 COWS	SM #2 AREA (m2)	SM #2 COWS	SM #3 AREA (m2)	SM #3 COWS
DRY LOT CORRAL- MILK COW, FULL SUN	DRY, RANDOM	8,330a	191	5,840o	108	11200c'	201	8,460q'	200
DRY LOT CORRAL- MILK COW, SHADE	DRY, RANDOM	334b	191	375p	108	1,000d'	201	390r'	200
DRY LOT CORRAL- MILK COW, FEEDER AREA	TYPICALLY MOIST	426c	191	259q	108	460e'	201	350s'	200
DRY LOT CORRAL- MILK COW, WATER TROUGH	TYPICALLY MOIST	208d	191	28r	108	37f'	201	149t'	200
DRY LOT CORRAL- MILK COW, STOCK PILE	UNDISTURBED, THICKEST	93e	191	697s	108	74g'	201	19u'	200
DRY LOT CORRAL- MILK COW, STOCK PILE	DISTURBED	93e	191	697s	108	74g'	201	19u'	200
DRY LOT CORRAL- MILK COW, DIURNAL TESTING, 24-HOURS	ONE LOCATION, EVERY 2-HOURS	NA	NA	NA	NA	NA	NA	NA	NA
DRY LOT CORRAL- MILK COW, FRESH MANURE	VERY FRESH	6f	191	NA	108	6h'	201	NA	200
DRY LOT CORRAL- DRY COW, FULL SUN	DRY, RANDOM	7,880g	170	6,160u	49	3,540i'	49	3,250v'	140
DRY LOT CORRAL- DRY COW, SHADE	DRY, RANDOM	803h	170	375v	49	186j'	49	160w'	140
DRY LOT CORRAL- DRY COW, FEEDER AREA	TYPICALLY MOIST	564k	170	259y	49	170k'	49	140x'	140
DRY LOT CORRAL- DRY COW, WATER TROUGH	TYPICALLY MOIST	381	170	28z	49	191'	49	37y'	140
DRY LOT CORRAL- DRY COW, FULL SUN	UNDISTURBED, THICKEST	56i	170	93w	49	28m'	49	56z'	140
DRY LOT CORRAL- DRY COW, FULL SUN	DISTURBED	56i	170	93w	49	28m'	49	56z'	140
DRY LOT CORRAL- DRY COW, FRESH MANURE	VERY FRESH	5j	170	NA	49	2n'	49	NA	140
MILK PARLOR EFFLUENT	RINSATE	NA	NA	NA	NA	NA	NA	NA	140
LIQUID STORAGE POND	UNDISTURB	4,450n	1,540	15000a'	1900	2,120o'	1,010	NA	790
STOCKPILE	UNDISTURB	NA	NA	4,400b'	1900	110p'	1,010	8090a''	790
STOCKPILE	DISTURBED	NA	NA	4,400b'	1900	110p'	1,010	NA	790
IRRIGATED PASTURE	GRASS	NA	NA	NA	NA	NA	NA	72900b''	790

TABLE 3B. (CONTINUED)

a - 51,300 ft2 + 51,300 ft2 = 103,000 ft2; 9,532 m2 - 426 m2 - 208 m2 - 334 m2 - 232 m2 - 6 m2 = 8,327 m2
b - 180' x 20' = 3,600 ft2; 334 m2
c - 2 x 9' x 255' = 4,590 ft2; 426 m2
d - 3 tanks: total 600 ft2; 56 m2 plus two other wet areas 600 ft2 + 1640 ft2 = 2,240 ft2; 208 m2
e - Sum of 1,000 ft2; 93 m2
f - 0.3 m2 per pile x no. cows/10 = (0.3 m2)(165)/10 = 5 m2
g - 49,021 ft2 + 51,554 ft2 = 100,575 ft2; 9,343 m2 - 803 m2 - 56 m2 - 5 m2 - 564 m2 - 38 m2 = 7,878 m2
h - 8,640 ft2; 803 m2
i - 600 ft2; 56 m2
j - 0.3 m2 per pile x no. cows/10 = (0.3 m2)(170)/10 = 5 m2
k - 9' x 675' = 6,075 ft2; 564 m2
l - 400 ft2; 38 m2
m - NA
n - 420' x 114' = 47,880 ft2; 4,450 m2
o - 74,500 ft2; 7,200 m2 - 375 m2 - 259 m2 - 28 m2 - 697 m2 = 5,841 m2
p - 20' x 202' = 4,040 ft2; 375 m2
q - 9' x 310' = 2,790 ft2; 259 m2
r - 300 ft2; 28 m2
s - 50' x 150' = 7,500 ft2; 697 m2
t - (0.3 m2)(80)/10 = 2m2
u - 74,400 ft2; 6,911 m2 - 375 m2 - 93 m2 - 259 m2 - 28 m2 = 6,156 m2
v - 202' x 20' = 4,040 ft2; 375 m2
w - 1,000 ft2 est.; 93 m2
x - (0.3 m2)(49)/10 = 2m2
y - 9' x 310' = 2,790 ft2; 259 m2
z - 300 ft2; 28 m2

a'- est. 162,000 ft2; 15,000 m2
b'- 282' x 168' = 47,376 ft2; 4,400 m2
c'- 570' x 240' = 137,500 ft2; 12,773 m2 - 1,003 m2 - 460 m2 - 6 m2 - 37 m2 - 74 m2 = 11,193 m2
d'- 20' x 540' = 10,800 ft2; 1,003 ft2
e'- 9' x 550 ' = 4,950 ft2; 460 m2
f'- 400 ft2; 37 m2
g'- 400 ft2 + 200 ft2 + 200 ft2 = 800 ft2; 74 m2
h'- (0.3 m2)(201)/10 = 6m2
i'- 42,427 ft2; 3,941 m2 - 186 m2 - 28 m2 - 2 m2 - 170 m2 - 19 m2 = 3,536 m2
j'- 20' x 100' = 2,000 ft2; 186 m2
k'- 9' x 203' = 1,827 ft2; 170 m2
l'- 200 ft2; 19 m2
m'- 300 ft2; 28 m2
n'- (0.3 m2)(49)/10 = 2m2
o'- 60' x 380' = 22,800 ft2; 2,120 m2
p'- 20' x 30' = 600 ft2 plus 15' x 36'= 540 ft; 1,140 ft2; 110 m2
q'- 100,800 ft2; 9,364 m2 - 350 m2 - 149 m2 - 19 m2 - 390 m2 = 8,460 m2
r'- 10' x 420' = 4,200 ft2; 390 m2
s'- 9' x 420' = 3,780 ft2; 350 m2
t'- 1,600 ft2; 149 m2
u'- 200 ft2; 19 m2

TABLE 3B. (CONTINUED)

v'- 40,700 ft2; 3,781 m2 - 56 m2 - 37 m2 - 160 m2 - 140 m2 = 3,248 m2
w'- 10' x 170' = 1,700 ft2; 160 m2
x'- 9' x 170' = 1,530 ft2; 140 m2
y'- 400 ft2; 37 m2
z'- 600 ft2; 56 m2
a''- 10% of 20 acres; (0.1) x 80,940 ft2; 8,094 m2
b''- 90% of 20 acres; (0.1) x 80,940 ft2; 72,850 m2

NOTES:

1) Milk cow and dry cow corral dimensions were measured; dry random areas calculated by subtracting shade, feeder, water trough, fresh manure and thick areas from gross surface area.

2) Shade areas were taken as overhead projection of awning or shade area.

3) Feeder areas (moist) were estimated as a 9' wide area per linear foot of feeder.

4) Water trough areas (moist) were estimated from visual inspection of trough areas.

5) Undisturbed thick areas were estimated from visual inspection of corrals.

6) Disturbed thick areas were estimated as undisturbed thick areas.

7) Fresh manure areas were estimated as 0.3 m2 per dropping with 1/10th of cows providing a fresh dropping at any time: (0.3 m2)(No. cows/10) = fresh area m2.

8) Water spray areas were taken as overhead projection of 10' width per lineal foot of spray line.

9) Liquid storage pond areas were measured at the time of testing, irregular shapes provide estimates of surface areas.

10) Stockpile areas measured at the time of testing. Surface roughness was not accounted for.

11) Irrigated pasture area estimated from rancher plot maps.

12) (ft2)(0.0929 m2/ft2) = (m2)

13) (acre)(4,047 m2/acre) = (m2)

14) Site surface are data rounded to 3 significant figures.

Table 4. PERCENT DIFFERENCE BETWEEN SCREENING AND LABORATORY AMMONIA DATA - ALL TEST DATA.

Sample	Lab Results (ppmv)	Sensidyne (ppmv)	% Difference
N-002	14	28	66.67%
N-003	100	260	88.89%
N-004	190	180	-5.41%
N-005	5.7	15	89.86%
N-006	900	740	-19.51%
N-007	1100	740	-39.13%
N-008	1.4	2.5	56.41%
N-009	2.4	2	-18.18%
N-010	28	45	46.58%
N-011	2.2	1	-75.00%
N-012	6.4	35	138.16%
N-013	3.4	3	-12.50%
N-014	2.2	1	-75.00%
N-016	2.3	1	-78.79%
N-017	2.2	2	-9.52%
N-018	1.7	1	-51.85%
N-019	7.2	10	32.56%
N-020	16	30	60.87%
N-021	6.2	8	25.35%
N-022	38	30	-23.53%
N-023	0.7	1	35.29%
N-024	1.8	1	-57.14%
N-025	16	26	47.62%
N-027	0.14	0.5	112.50%
N-028	0.29	0.5	53.16%
N-029	2.7	4	38.81%
N-030	1.1	4	113.73%
N-035	9	18	66.67%
N-036	9.5	12	23.26%
N-037	90	210	80.00%
N-038	43	140	106.01%
N-039	13	25	63.16%
N-40	19	25	27.27%
N-41	22	20	-9.52%
N-42	19	19	0.00%
N-43	15	15	0.00%
N-44	13	18	32.26%
N-45	15	18	18.18%
N-46	5.9	5	-16.51%
N-47	130	250	63.16%
N-48	26	40	42.42%
N-49	17	30	55.32%
N-50	3.9	5	24.72%

Table 4. CONTINUED.

Sample	Lab Results (ppmv)	Sensidyne (ppmv)	% Difference
N-51	5	5	0.00%
N-52	1.1	1.5	30.77%
N-53	4.1	5	19.78%
N-53-HR	31	34	9.23%
N-54	66	200	100.75%
N-55	93	200	73.04%
N-56	31	34	9.23%
N-57	3.6	2	-57.14%
N-58	5.5	7	24.00%
N-59	5.3	7	27.64%
N-60	19	32	50.98%
N-61	300	420	33.33%
N-62	11	12	8.70%
N-63	27	55	68.29%
N-64	3.2	5	43.90%
N-65	3.4	5	38.10%
N-66	0	0	0.00%
N-67	0.32	0.5	43.90%
N-68	10	14	33.33%
N-69	11	10	-9.52%
N-70	1.1	1.5	30.77%
N-74	40	60	40.00%
N-75	2.9	4	31.88%
N-76	11	13	16.67%
N-77	1.8	1.5	-18.18%
N-78	6.3	9	35.29%
N-79	2.2	1.5	-37.84%
N-80	0.94	1	6.19%
N-81	4.2	3.5	-18.18%
N-82	6.8	4	-51.85%
N-83	14	15	6.90%
N-85	4.1	3	-30.99%
N-86	9.8	15	41.94%
N-87	6.4	7	8.96%
N-88	0.43	0.5	15.05%
N-89	0.7	0.5	-33.33%
N-90	1.8	2	10.53%
N-91	5.1	10	64.90%
N-92	16	25	43.90%
N-93	0.62	1	46.91%
N-94	0.87	1	13.90%
N-95	10	10	0.00%
N-96	9.4	10	6.19%

Table 4. CONTINUED.

Sample	Lab Results (ppmv)	Sensidyne (ppmv)	% Difference
N-97	7.4	4	-59.65%
N-98	1.4	1	-33.33%
N-99	14	7	-66.67%
N-100	5.5	1	-138.46%
N-101	84	100	17.39%
N-102	85	100	16.22%
N-103	3.9	2	-64.41%
N-104	4.6	2	-78.79%
N-105	20	50	85.71%
N-106	220	190	-14.63%
N-107	72	210	97.87%
N-108	47	130	93.79%
N-109	490	620	23.42%
N-110	65	110	51.43%
N-111	200	210	4.88%
N-112	31	70	77.23%
N-113	4.3	5	15.05%
N-114	6.8	24	111.69%
N-115	230	120	-62.86%
N-116	1.9	1	-62.07%
N-117	670	600	-11.02%
N-118	7.1	7	-1.42%
N-119	1.1	0.5	-75.00%
N-120	3.7	5	29.89%
N-121	15	30	66.67%
N-122	3.1	5	46.91%
N-123	7.8	16	68.91%
N-124	6.3	11	54.34%
N-125	2	3	40.00%
N-126	15	32	72.34%
N-127	0.96	2	70.27%
N-129	1.4	1	-33.33%
N-130	5.2	10	63.16%
		Average	19.33%
		St. Deviation	50.11%

TABLE 5A. SUMMARY OF VOC CONCENTRATION DATA, ppbv (EPA TO-14) - SUMMER TEST

COMPOUND	C001	C002	C003	C004	C005	C006	C007	C008	C009	C009D
FREON 12	<0.70	<0.75	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
FREON 114	<0.70	<0.75	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
CHLOROMETHANE	<0.70	2.3	<0.70	<0.70	<0.70	7.7	26	<0.75	<0.70	<0.85
VINYL CHLORIDE	<0.70	<0.75	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
BROMOMETHANE	<0.70	<0.75	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
CHLOROETHANE	<0.70	<0.75	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
FREON 11	<0.70	<0.75	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
1,1-DICHLOROETHANE	<0.70	<0.75	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
FREON 113	<0.70	<0.75	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
METHYLENE CHLORIDE	<0.70	<0.75	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	15	14
1,1-DICHLOROETHANE	<0.70	<0.75	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
cis-1,2-DICHLOROETHENE	<0.70	<0.75	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	0.84	0.99
CHLOROFORM	<0.70	<0.75	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
1,1,1-TRICHLOROETHANE	<0.70	11	2.0	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
CARBON TETRACHLORIDE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
BENZENE	<0.70	<0.70	<0.70	<0.70	<0.70	1.5	2.4	<0.75	<0.70	<0.85
1,2-DICHLOROEHTANE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
TRICHLOROETHENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	5.5	5.7
1,2-DICHLOROPROPANE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
cis-1,3-DICHLOROPROPENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
TOLUENE	<0.70	<0.70	1.1	<0.70	3.5	2.4	5.6	1.6	<0.70	<0.85
trans-1,3-DICHLOROPROPENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
1,1,2-TRICHLOROETHANE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
TETRACHLOROETHENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
ETHYLENE DIBROMIDE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
CHLOROBENZENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85

TABLE 5A. (CONTINUED)

ETHYL BENZENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
m,P-XYLENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	2.0	<0.75	<0.70	<0.85
o-XYLENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
STYRENE	<0.70	<0.70	<0.70	<0.70	<0.70	0.75	2.2	<0.75	<0.70	<0.85
1,1,2,2-TETRACHLOROETHANE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
1,3,5-TRIMETHYLBENZENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
1,2,4-TRIMETHYLBENZENE	<0.70	<0.70	<0.70	<0.70	<0.70	0.94	0.94	<0.75	<0.70	<0.85
1,3-DICHLOROBENZENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
1,4-DICHLOROBENZENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
CHLOROTOLUENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
1,2-DICHLOROBENZENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
1,2,4-TRICHLOROBENZENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
HEXACHLOROBUTADIENE	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.70	<0.75	<0.70	<0.85
PROPYLENE	<2.8	<3.0	<2.8	<2.8	<2.8	110	160	3.6	<2.8	<3.4
1,3-BUTADIENE	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
ACETONE	4.2	27	3.0	<2.8	<2.8	26	30	52	7.8	7.7
CARBON DISULFIDE	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	4.1	44	<2.8	3.1J
2-PROPANOL	4.5	7.2	3.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
trans-1,2-DICHLOROETHENE	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
VINYL ACETATE	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
CHLOROPRENE	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
2-BUTANONE (MEK)	<2.8	3.7	<2.8	<2.8	<2.8	6.4	12	7.6	<2.8	<3.4
HEXANE	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
TETRAHYDROFURAN	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
CYCLOHEXANE	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
1,4-DIOXANE	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
BROMODICHLOROMETHANE	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4

TABLE 5A. (CONTINUED)

4-METHYL-2-PETANONE	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	4.1	<3.0	<2.8	<3.4
2-HEXANONE (MIBK)	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
DIBROMOCHLOROMETHANE	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
BROMOFORM	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
4-ETHYLTOLUENE	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
ETHANOL	54	69	<2.8	<2.8	<2.8	41	25	<3.0	14	16
METHYL t-BUTYL ETHER (MTBE)	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
HEPTANE	<2.8	<3.0	<2.8	<2.8	<2.8	<2.8	<2.8	<3.0	<2.8	<3.4
TNMHC*	350	340	260	160	160	320	440	290	56	58

FOOTNOTES:

PRE-TEST SYSTEM BLANK: C001, T001, N001, A001, F001, S001
LG. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C002/C003 (REPL), N005, T002/T003 (REPL), F002, A002, S002
LG. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C004, N017, T004, A003, S003/S004 (REPL), F003
LG. DAIRY #1, LIQUID POND: C005, N029, T005, S005, F004, A004
SM. DAIRY #1, UNDISTURBED STOCKPILE: C006, T006, N035, S006, F005, A005/A006 (REPL)
SM. DAIRY #1, DISTURBED STOCKPILE: C007, T007, N038, S007, F006/F007 (REPL), A007
SM. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C008, N050/N051 (REPL), T008, F008, S008, A008
SM. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C009, N075, T009, S010, A010
SPLIT SAMPLE: A009, S009, N061

B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION <u>NOT</u> PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 5B. SUMMARY OF VOC CONCENTRATION DATA, ppbv (EPA TO-14) - WINTER TEST

COMPOUND	C001	C001-D
FREON 12	<0.70	<0.70
FREON 114	<0.70	<0.70
CHLOROMETHANE	<0.70	<0.70
VINYL CHLORIDE	<0.70	<0.75
BROMOMETHANE	<0.70	<0.75
CHLOROETHANE	<0.70	<0.75
FREON 11	<0.70	<0.75
1,1-DICHLOROETHANE	<0.70	<0.75
FREON 113	<0.70	<0.75
METHYLENE CHLORIDE	<0.70	<0.75
1,1-DICHLOROETHANE	<0.70	<0.75
cis-1,2-DICHLOROETHENE	<0.70	<0.75
CHLOROFORM	<0.70	<0.75
1,1,1-TRICHLOROETHANE	<0.70	<0.70
CARBON TETRACHLORIDE	<0.70	<0.70
BENZENE	<0.70	<0.70
1,2-DICHLOROEHTANE	<0.70	<0.70
TRICHLOROETHENE	<0.70	<0.70
1,2-DICHLOROPROPANE	<0.70	<0.70
cis-1,3-DICHLOROPROPENE	<0.70	<0.70
TOLUENE	0.92	0.93
trans-1,3-DICHLOROPROPENE	<0.70	<0.70
1,1,2-TRICHLOROETHANE	<0.70	<0.70
TETRACHLOROETHENE	<0.70	<0.70
ETHYLENE DIBROMIDE	<0.70	<0.70
CHLOROBENZENE	<0.70	<0.70
ETHYL BENZENE	<0.70	<0.70
m,P-XYLENE	<0.70	<0.70
o-XYLENE	<0.70	<0.70
STYRENE	<0.70	<0.70
1,1,2,2-TETRACHLOROETHANE	<0.70	<0.70
1,3,5-TRIMETHYLBENZENE	<0.70	<0.70
1,2,4-TRIMETHYLBENZENE	<0.70	<0.70
1,3-DICHLOROBENZENE	<0.70	<0.70
1,4-DICHLOROBENZENE	<0.70	<0.70
CHLOROTOLUENE	<0.70	<0.70

TABLE 5B. (CONTINUED)		
1,2-DICHLOROBENZENE	<0.70	<0.70
1,2,4-TRICHLOROBENZENE	<0.70	<0.70
HEXACHLOROBUTADIENE	<0.70	<0.70
PROPYLENE	<2.8	<2.8
1,3-BUTADIENE	<2.8	<2.8
ACETONE	54	51
CARBON DISULFIDE	<2.8	<2.8
2-PROPANOL	<2.8	<2.8
trans-1,2-DICHLOROETHENE	<2.8	<2.8
VINYL ACETATE	<2.8	<2.8
CHLOROPRENE	<2.8	<2.8
2-BUTANONE (MEK)	6.5	6.8
HEXANE	<2.8	<2.8
TETRAHYDROFURAN	<2.8	<2.8
CYCLOHEXANE	<2.8	<2.8
1,4-DIOXANE	<2.8	<2.8
BROMODICHLOROMETHANE	<2.8	<2.8
4-METHYL-2-PETANONE	<2.8	<2.8
2-HEXANONE (MIBK)	<2.8	<2.8
DIBROMOCHLOROMETHANE	<2.8	<2.8
BROMOFORM	<2.8	<2.8
4-ETHYLTOLUENE	<2.8	<2.8
ETHANOL	22	21
METHYL t-BUTYL ETHER (MTBE)	<2.8	<2.8
HEPTANE	<2.8	<2.8
TNMHC*	190	170

FOOTNOTES:
SM. DAIRY #3, MILK COW CORRAL, DRY RANDOM: C001, N146, T001, F001, A001, S001
SPLIT SAMPLE

B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 6A. SUMMARY OF REDUCED SUFLUR COMPOUND CONCENTRATION, ppbv (ASTM D-5504) - SUMMER TEST

COMPOUND	T001	T002	T003	T004	T005	T006	T007	T008	T009
HYDROGEN SULFIDE	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	13	<4.0
CARBONYL SULFIDE	<4.0	11	5.9	<4.0	4.4	<4.0	<4.0	<4.0	<4.0
METHYL MERCAPTAN	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	17	<4.0
DIMETHYL SULFIDE	<4.0	<4.0	<4.0	<4.0	<4.0	12	24	10	<4.0
CARBON DISULFIDE	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	8.8	<4.0
DIMETHYL DISULFIDE	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
ETHYL MERCAPTAN	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
ISOPROPYLMERCAPTAN	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
tert-BUTYL MERCAPTAN	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
n-PROPYLMERCAPTAN	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
ETHYL METHYL SULFIDE	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
THIOPHENE	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
ISOBUTYL MERCAPTAN	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
DIETHYL SULFIDE	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
n-BUTYLMERCAPTAN	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
3-METHYLTHIOPHENE	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
TETRAHYDROTHIOPHENE	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
2-ETHYLTHIOPHENE	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
2,5-DIMETHYLTHIOPHENE	<4.0	4.3	4.1	<4.0	5.2	<4.0	<4.0	<4.0	<4.0
DIETHYL DISULFIDE	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0

FOOTNOTES:
PRE-TEST SYSTEM BLANK: C001, T001, N001, A001, F001, S001
LG. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C002/C003 (REPL), N005, T002/T003 (REPL), F002, A002, S002
LG. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C004, N017, T004, A003, S003/S004 (REPL), F003
LG. DAIRY #1, LIQUID POND: C005, N029, T005, S005, F004, A004
SM. DAIRY #1, UNDISTURBED STOCKPILE: C006, T006, N035, S006, F005, A005/A006 (REPL)
SM. DAIRY #1, DISTURBED STOCKPILE: C007, T007, N038, S007, F006/F007 (REPL), A007
SM. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C008, N050/N051 (REPL), T008, F008, S008, A008
SM. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C009, N075, T009, S010, A010
SPLIT SAMPLE: A009, S009, N061

B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 6B. SUMMARY OF REDUCED SUFLUR COMPOUND CONCENTRATION, ppbv (ASTM D-5504) - WINTER TEST

COMPOUND	T001
HYDROGEN SULFIDE	<4.0
CARBONYL SULFIDE	<4.0
METHYL MERCAPTAN	31
DIMETHYL SULFIDE	7.4
CARBON DISULFIDE	<4.0
DIMETHYL DISULFIDE	<4.0
ETHYL MERCAPTAN	<4.0
ISOPROPYLMERCAPTAN	<4.0
tert-BUTYL MERCAPTAN	<4.0
n-PROPYLMERCAPTAN	<4.0
ETHYL METHYL SULFIDE	<4.0
THIOPHENE	<4.0
ISOBUTYL MERCAPTAN	<4.0
DIETHYL SULFIDE	<4.0
n-BUTYLMERCAPTAN	<4.0
3-METHYLTHIOPHENE	<4.0
TETRAHYDROTHIOPHENE	<4.0
2-ETHYLTHIOPHENE	<4.0
2,5-DIMETHYLTHIOPHENE	<4.0
DIETHYL DISULFIDE	<4.0

FOOTNOTES:
SM. DAIRY #3, MILK COW CORRAL, DRY RANDOM: C001, N146, T001, F001, A001, S001
SPLIT SAMPLE

B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 7A. SUMMARY OF CARBONYL COMPOUND CONCENTRATION DATA, ppbv (EPA TO-5) - SUMMER TEST

COMPOUND	F001	F002	F003	F003D	C004	C005	C005D	C006	C007	F008	C009
FORMALDEHYDE	16	27	37	37	60	22	22	61	36	120	66
ACETALDEHYDE	6.6	8.2	25	25	16	22B	25B	36B	33B	26B	16B
ACROLEIN	<1.4	<1.5	<1.5	<1.5	<1.4	<1.8	<1.8	<3.2	<2.9	<1.3	<1.3
PROPANAL	<1.4	<1.4	3.2	3.2	2.6	2.6	2.7	<3.1	3.1	2.4	2.1
ACETONE	3.7B	<1.4	28B	26B	24B	36B	36B	75B	11B	2.6B	4.1B
CROTONALYDEHYDE	<1.1	<1.2	<1.2	<1.2	<1.1	<1.4	<1.4	<2.6	<2.3	<1.0	<1.0
ISOBUTYALDEHYDE (MEK)	<1.1	<1.2	1.8	1.8	1.8	<1.4	<1.4	<2.5	<2.2	<0.99	<0.98
BENZALDEHYDE	<0.75	<0.79	<0.82	<0.82	<0.72	<0.94	<0.94	<1.7	1.7	<0.67	<0.67
ISOPENTANAL	4.2	<0.98	3.1	3.1	3.1	5.9	6.0	5.5	34	30	22
PENTANAL	<0.92	<0.98	<1.0	<1.0	<0.89	<1.2	<1.2	<2.1	<1.9	<0.83	<0.82
m-TOLUALDEHYDE	2.0	<0.70	13	8.6	18	35	33	38	<1.4	<0.59	<0.59
p-TOLUALDEHYDE	<0.66	<0.70	<0.72	<0.72	<0.64	<0.83	<0.83	<1.5	<1.4	<0.59	<0.59
o-TOLUALDEHYDE	<0.66	<0.70	<0.72	<0.72	<0.64	<0.83	<0.83	<1.5	<1.4	<0.59	<0.59
HEXANAL	<0.79	<0.84	<0.86	<0.86	<0.77	58	58	86	<1.6	<0.71	<0.71

FOOTNOTES:
PRE-TEST SYSTEM BLANK: C001, T001, N001, A001, F001, S001
LG. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C002/C003 (REPL), N005, T002/T003 (REPL), F002, A002, S002
LG. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C004, N017, T004, A003, S003/S004 (REPL), F003
LG. DAIRY #1, LIQUID POND: C005, N029, T005, S005, F004, A004
SM. DAIRY #1, UNDISTURBED STOCKPILE: C006, T006, N035, S006, F005, A005/A006 (REPL)
SM. DAIRY #1, DISTURBED STOCKPILE: C007, T007, N038, S007, F006/F007 (REPL), A007
SM. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C008, N050/N051 (REPL), T008, F008, S008, A008
SM. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C009, N075, T009, S010, A010
SPLIT SAMPLE: A009, S009, N061
B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 7B. SUMMARY OF CARBONYL COMPOUND CONCENTRATION DATA, ppbv (EPA TO-5) - WINTER TEST

COMPOUND	F001A/B	F001A/B-D
FORMALDEHYDE	35	35
ACETALDEHYDE	30B	30B
ACROLEIN	<1.4	<1.4
PROPANAL	25	25
ACETONE	6.6	6.6
CROTONALYDEHYDE	<1.2	<1.2
ISOBUTYALDEHYDE (MEK)	6.3	6.3
BENZALDEHYDE	<0.76	<0.76
ISOPENTANAL	46B	46B
PENTANAL	<0.94	<0.94
m-TOLUALDEHYDE	<0.68	<0.68
p-TOLUALDEHYDE	6.8	6.8
o-TOLUALDEHYDE	<0.68	<0.68
HEXANAL	24	24

FOOTNOTES:
SM. DAIRY #3, MILK COW CORRAL, DRY RANDOM: C001, N146, T001, F001, A001, S001
SPLIT SAMPLE

B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 8A. SUMMARY OF SVOC CONCENTRATION, ppbv (EPA 8270) - SUMMER TEST

COMPOUND	S001	S002	S003	S004	S005	S006	S007	S008	S009	S010	S010D
PHENOL	<6.4	<6.1	<6.6	<6.4	<6.1	<7.4	<6.4	<5.4	<7.2	<5.6	<5.6
bis(2-CHLOROETHYL) ETHER	<4.2	<4.0	<4.4	<4.2	<4.0	<4.9	<4.2	<3.5	<4.7	<3.7	<3.7
2-CHLOROPHENOL	<4.7	<4.5	<4.9	<4.7	<4.5	<5.4	<4.7	<3.9	<5.2	<4.1	<4.1
1,3-DICHLOROBENZENE	<4.1	<3.9	<4.2	<4.1	<3.9	<4.7	<4.1	<3.4	<4.6	<3.6	<3.6
1,4-DICHLOROBENZENE	<4.1	<3.9	<4.2	<4.1	,3.9	<4.7	<4.1	<3.4	<4.6	<3.6	<3.6
1,2-DICHLOROBENZENE	<4.1	<3.9	<4.2	<4.1	<3.9	<4.7	<4.1	<3.4	<4.6	<3.6	<3.6
2-METHYLPHENOL	<5.6	<5.3	<5.8	<5.6	<5.3	<6.4	<5.6	<4.7	<6.2	<4.9	<4.9
bis(2-CHLOROISOPROPYL) ETHER	<3.5	<3.4	<3.7	<3.5	<3.4	<4.1	<3.5	<3.0	<4.0	<3.1	<3.1
N-NITROSO-di-n-PROPYLAMINE	<4.6	<4.4	<4.8	<4.6	<4.4	<5.4	<4.6	<3.9	<5.2	<4.1	<4.1
4-METHYLPHENOL	<5.6	<5.3	<5.8	<5.6	<5.3	<6.4	<5.6	<4.7	<6.2	<4.9	<4.9
HEXACHLOROETHANE	<2.5	<2.4	<2.6	<2.5	<2.4	<2.9	<2.5	<2.1	<2.8	<2.2	<2.2
NITROBENZENE	<4.9	<4.7	<5.1	<4.9	<4.7	<5.7	<4.9	<4.1	<5.5	<4.3	<4.3
ISOPHORONE	<4.4	<4.2	<4.5	<4.4	<4.2	<5.0	<4.4	<3.6	<4.9	<3.8	<3.8
2-NITROPHENOL	<4.3	<4.2	<4.5	<4.3	<4.2	<5.0	<4.3	<3.6	<4.8	<3.8	<3.8
2,4-DIMETHYLPHENOL	<4.9	<4.7	<5.1	<4.9	<4.7	<5.7	<4.9	<4.1	<5.5	<4.3	<4.3
BENZOIC ACID	<4.9	<4.7	<5.1	<4.9	<4.7	<5.7	<4.9	<4.1	<5.5	<4.3	<4.3
bis(2-CHLOROETHOXY) METHANE	<3.5	<3.4	<3.6	<3.5	<3.4	<4.0	<3.5	<2.9	<3.9	<3.1	<3.1
2,4-DICHLOROPHENOL	<3.7	<3.5	<3.8	<3.7	<3.5	<4.3	<3.7	<3.1	<4.1	<3.2	<3.2
1,2,4-TRICHLOROBENZENE	<5.0	<4.8	<5.2	<5.0	<4.8	<5.8	<5.0	<4.2	<5.6	<4.4	<4.4
NAPHTHALENE	<4.7	<4.5	<4.9	<4.7	<4.5	<5.4	<4.7	<3.9	<5.2	<4.1	<4.1
4-CHLOROANILINE	<4.7	<4.5	<4.9	<4.7	<4.5	<5.5	<4.7	<4.0	<5.3	<4.1	<4.1
HEXACHLOROBUTADIENE	<2.3	<2.2	<2.4	<2.3	<2.2	<2.7	<2.3	<1.9	<2.6	<2.0	<2.0
4-CHLORO-3-METHYLPHENOL	<4.2	<4.0	<4.4	<4.2	<4.0	<4.9	<4.2	<3.5	<4.7	<3.7	<3.7
2-METHYLNAPHTHALENE	<4.2	<4.0	<4.4	<4.2	<4.0	<4.9	<4.2	<3.6	<4.7	<3.7	<3.7
HEXACHLOROCYCLOPENTADIENE	<2.2	<2.1	<2.3	<2.2	<2.1	<2.6	<2.2	<1.8	<2.5	<1.9	<1.9
2,4,6-TRICHLOROPHENOL	<3.0	<2.9	<3.2	<3.0	<2.9	<3.5	<3.0	<2.6	<3.4	<2.7	<2.7

TABLE 8A. (CONTINUED)

2,4,5-TRICHLOROPHENOL	<3.0	<2.9	<3.2	<3.0	<2.9	<3.5	<3.0	<2.6	<3.4	<2.7	<2.7
2-CHLORONAPHTHALENE	<3.7	<3.6	<3.8	<3.7	<3.6	<4.3	<3.7	<3.1	<4.1	<3.2	<3.2
2-NITROANILINE	<4.4	<4.2	<4.5	<4.4	<4.2	<5.0	<4.4	<3.6	<4.9	<3.8	<3.8
DIMETHYLPHTHALATE	<3.1	<3.0	<3.2	<3.1	<3.0	<3.6	<3.1	<2.6	<3.5	<2.7	<2.7
ACENAPHTHYLENE	<4.0	<3.8	<4.1	<4.0	<3.8	<4.6	<4.0	<3.3	<4.4	<3.5	<3.5
2,6-DINITROTOLUENE	<4.7	<4.5	<4.9	<4.7	<4.5	<5.4	<4.7	<3.9	<5.2	<4.1	<4.1
3-NITROANILINE	<4.4	<4.2	<4.5	<4.4	<4.2	<5.0	<4.4	<3.6	<4.9	<3.8	<3.8
ACENAPHTHENE	<3.9	<3.7	<4.0	<3.9	<3.7	<4.5	<3.9	<3.3	<4.4	<3.4	<3.4
2,4-DINITROPHENOL	<3.3	<3.1	<3.4	<3.3	<3.1	<3.8	<3.3	<2.7	<3.6	<2.9	<2.9
4-NITROPHENOL	<4.3	<4.2	<4.5	<4.3	<4.2	<5.0	<4.3	<3.6	<4.8	<3.8	<3.8
2,4-DINITROTOLUENE	<4.7	<4.5	<4.9	<4.7	<4.5	<5.4	<4.7	<3.9	<5.2	<4.1	<4.1
DIBENZOFURAN	<3.6	<3.4	<3.7	<3.6	<3.4	<4.1	<3.6	<3.0	<4.0	<3.1	<3.1
DIETHYLPHTHALATE	<3.6	<3.5	<3.8	<3.6	<3.5	<4.2	<3.6	<3.0	<4.0	<3.2	<3.2
FLUORENE	<3.6	<3.5	<3.8	<3.6	<3.5	<4.2	<3.6	<3.0	<4.0	<3.2	<3.2
4-CHLOROPHENYL-PHENYL ETHER	<2.9	<2.8	<3.0	<2.9	<2.8	<3.4	<2.9	<2.5	<3.3	<2.6	<2.6
4-NITROANILINE	<4.4	<4.2	<4.5	<4.4	<4.2	<5.0	<4.4	<3.6	<4.9	<3.8	<3.8
4,6-DINITRO-2-METHYLPHENOL	<3.0	<2.9	<3.2	<3.0	<2.9	<3.5	<3.0	<2.5	<3.4	<2.7	<2.7
N-NITROSODIPHENYLAMINE	<3.0	<2.9	<3.2	<3.0	<2.9	<3.5	<3.0	<2.5	<3.4	<2.7	<2.7
4-BROMOPHENYL-PHENYL ETHER	<2.0	<2.0	<2.1	<2.0	<2.0	<2.4	<2.0	<1.7	<2.3	<1.8	<1.8
HEXACHLOROBENZENE	<2.1	<2.0	<2.2	<2.1	<2.0	<2.4	<2.1	<1.8	<2.4	<1.8	<1.8
PENTACHLOROPHENOL	<2.2	<2.2	<2.3	<2.2	<2.2	<2.6	<2.2	<1.9	<2.5	<2.0	<2.0
PHENANTHRENE	<3.4	<3.2	<3.5	<3.4	<3.2	<3.9	<3.4	<2.8	<3.8	<3.0	<3.0
ANTHRACENE	<3.4	<3.2	<3.5	<3.4	<3.2	<3.9	<3.4	<2.8	<3.8	<3.0	<3.0
di-n-BUTYLPHTHALATE	6.0B	4.9B	6.9B	0.22B	8.0B	<2.5	<2.2	<1.8	<2.4	<1.9	<1.9
FLUORANTHENE	<3.0	<2.8	<3.1	<3.0	<2.8	<3.4	<3.0	<2.5	<3.3	<2.6	<2.6
PYRENE	<3.0	<2.8	<3.1	<3.0	<2.8	<3.4	<3.0	<2.5	<3.3	<2.6	<2.6
BUTYLBENZYLPHTHALATE	<1.9	<1.8	<2.0	<1.9	<1.8	<2.2	<1.9	<1.6	<2.2	<1.7	<1.7
3,3'-DICHLOROBENZIDINE	<2.4	<2.3	<2.5	<2.4	<2.3	<2.8	<2.4	<2.0	<2.7	<2.1	<2.1

TABLE 8A. (CONTINUED)

CHRYSENE	<2.6	<2.5	<2.7	<2.6	<2.5	<3.0	<2.6	<2.2	<3.0	<2.3	<2.3
BENZO(A)ANTHRACENE	<2.6	<2.5	<2.7	<2.6	<2.5	<3.0	<2.6	<2.2	<3.0	<2.3	<2.3
bis(2-ETHYLHEXYL)PHTHALATE	17	17	<1.6	<1.5	36	<1.8	<1.5	<1.3	<1.7	<1.4	<1.4
di-n-OCTYLPHTHALATE	<1.5	<1.5	<1.6	<1.5	<1.5	<1.8	<1.5	<1.3	<1.7	<1.4	<1.4
BENZO(b)FLUORANTHENE	<2.4	<2.3	<2.5	<2.4	<2.3	<2.8	<2.4	<2.0	<2.7	<2.1	<2.1
BENZO(k)FLUORANTHENE	<2.4	<2.3	<2.5	<2.4	<2.3	<2.8	<2.4	<2.0	<2.7	<2.1	<2.1
BENZO(a)PYRENE	<2.4	<2.3	<2.5	<2.4	<2.3	<2.8	<2.4	<2.0	<2.7	<2.1	<2.1
INDENO(1,2,3-c,d)PYRENE	<2.2	<2.1	<2.3	<2.2	<2.1	<2.5	<2.2	<1.9	<2.4	<1.9	<1.9
DIBENZ(a,h)ANTHRACENE	<2.2	<2.1	<2.2	<2.2	<2.1	<2.5	<2.2	<1.8	<2.4	<1.9	<1.9
BENZO(g,h,i)PERYLENE	<2.2	<2.1	<2.3	<2.2	<2.1	<2.5	<2.2	<1.8	<2.4	<1.9	<1.9

FOOTNOTES:
PRE-TEST SYSTEM BLANK: C001, T001, N001, A001, F001, S001
LG. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C002/C003 (REPL), N005, T002/T003 (REPL), F002, A002, S002
LG. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C004, N017, T004, A003, S003/S004 (REPL), F003
LG. DAIRY #1, LIQUID POND: C005, N029, T005, S005, F004, A004
SM. DAIRY #1, UNDISTURBED STOCKPILE: C006, T006, N035, S006, F005, A005/A006 (REPL)
SM. DAIRY #1, DISTURBED STOCKPILE: C007, T007, N038, S007, F006/F007 (REPL), A007
SM. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C008, N050/N051 (REPL), T008, F008, S008, A008
SM. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C009, N075, T009, S010, A010
SPLIT SAMPLE: A009, S009, N061
B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 8B. SUMMARY OF SVOC CONCENTRATION, ppbv (EPA 8270) - WINTER TEST

COMPOUND	S001
PHENOL	<6.4
bis(2-CHLOROETHYL) ETHER	<4.2
2-CHLOROPHENOL	<4.7
1,3-DICHLOROBENZENE	<4.1
1,4-DICHLOROBENZENE	<4.1
1,2-DICHLOROBENZENE	<4.1
2-METHYLPHENOL	<5.6
bis(2-CHLOROISOPROPYL) ETHER	<3.6
N-NITROSO-di-n-PROPYLAMINE	<4.7
4-METHYLPHENOL	<5.6
HEXACHLOROETHANE	<2.6
NITROBENZENE	<4.9
ISOPHORONE	<4.4
2-NITROPHENOL	<4.4
2,4-DIMETHYLPHENOL	<5.0
BENZOIC ACID	<5.0
bis(2-CHLOROETHOXY) METHANE	<3.5
2,4-DICHLOROPHENOL	<3.7
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	6.2
4-CHLOROANILINE	<4.8
HEXACHLOROBUTADIENE	<2.3
4-CHLORO-3-METHYLPHENOL	<4.2
2-METHYLNAPHTHALENE	<4.3
HEXACHLOROCYCLOPENTADIENE	<2.2
2,4,6-TRICHLOROPHENOL	<3.1
2,4,5-TRICHLOROPHENOL	<3.1
2-CHLORONAPHTHALENE	<3.7
2-NITROANILINE	<4.4
DIMETHYLPHTHALATE	<3.1
ACENAPHTHYLENE	<4.0
2,6-DINITROTOLUENE	<4.7
3-NITROANILINE	<4.4
ACENAPHTHENE	<3.9
2,4-DINITROPHENOL	<3.3
4-NITROPHENOL	<4.4
2,4-DINITROTOLUENE	<4.7

TABLE 8B. (CONTINUED)	
DIBENZOFURAN	<3.6
DIETHYLPHTHALATE	<3.6
FLUORENE	<3.6
4-CHLOROPHENYL-PHENYL ETHER	<3.0
4-NITROANILINE	<4.4
4,6-DINITRO-2-METHYLPHENOL	<3.1
N-NITROSODIPHENYLAMINE	<3.1
4-BROMOPHENYL-PHENYL ETHER	<2.1
HEXACHLOROBENZENE	<2.1
PENTACHLOROPHENOL	<2.3
PHENANTHRENE	<3.4
ANTHRACENE	<3.4
di-n-BUTYLPHTHALATE	8:5
FLUORANTHENE	<3.0
PYRENE	<3.0
BUTYLBENZYLPHTHALATE	<1.9
3,3'-DICHLOROBENZIDINE	<2.4
CHRYSENE	<2.7
BENZO(A)ANTHRACENE	<2.7
bis(2-ETHYLHEXYL)PHTHALATE	30B
di-n-OCTYLPHTHALATE	<1.6
BENZO(b)FLUORANTHENE	<2.4
BENZO(k)FLUORANTHENE	<2.4
BENZO(a)PYRENE	<2.4
INDENO(1,2,3-c,d)PYRENE	<2.2
DIBENZ(a,h)ANTHRACENE	<2.2
BENZO(g,h,i)PERYLENE	<2.2

FOOTNOTES:
SM. DAIRY #3, MILK COW CORRAL, DRY RANDOM: C001, N146, T001, F001, A001, S001
SPLIT SAMPLE

B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 9A. SUMMARY OF AMINE COMPOUND CONCENTRATION DATA, ppbv (EPA TO-5) - SUMMER TEST

COMPOUND	A001	A002	A003	A004	A005	A006	A007	A008	A009	A010
DIETHYLAMINE	<170	<160	<170	<170	<260	<260	<180	<150	<140	<150
DIMETHYLAMINE	1,000	<270	<280	<270	<420	<430	<280	<250	<230	<250

FOOTNOTES:

PRE-TEST SYSTEM BLANK: C001, T001, N001, A001, F001, S001
LG. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C002/C003 (REPL), N005, T002/T003 (REPL), F002, A002, S002
LG. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C004, N017, T004, A003, S003/S004 (REPL), F003
LG. DAIRY #1, LIQUID POND: C005, N029, T005, S005, F004, A004
SM. DAIRY #1, UNDISTURBED STOCKPILE: C006, T006, N035, S006, F005, A005/A006 (REPL)
SM. DAIRY #1, DISTURBED STOCKPILE: C007, T007, N038, S007, F006/F007 (REPL), A007
SM. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C008, N050/N051 (REPL), T008, F008, S008, A008
SM. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C009, N075, T009, S010, A010
SPLIT SAMPLE: A009, S009, N061

B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 9B. SUMMARY OF AMINE COMPOUND CONCENTRATION DATA, ppbv (EPA TO-5) - WINTER TEST

COMPOUND	A001
DIETHYLAMINE	<200
DIMETHYLAMINE	<410

FOOTNOTES:
SM. DAIRY #3, MILK COW CORRAL, DRY RANDOM: C001, N146, T001, F001, A001, S001
SPLIT SAMPLE

B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 10A. SUMMARY OF VOC FLUX DATA, ug/m^2,min^{-1} (EPA TO-14) - SUMMER TEST

COMPOUND	C001	C002	C003	C004	C005	C006	C007	C008	C009	C009D
FREON 12	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.016
FREON 114	<0.19	<0.20	<0.19	<0.19	<0.19	<0.19	<0.19	<0.20	<0.19	<0.23
CHLOROMETHANE	<0.056	0.18	<0.056	<0.056	<0.56	0.62	2.1	<0.061	<0.056	<0.069
VINYL CHLORIDE	<0.090	<0.075	<0.070	<0.70	<0.070	<0.070	<0.70	<0.075	<0.070	<0.085
BROMOMETHANE	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.13
CHLOROETHANE	<0.072	<0.077	<0.072	<0.072	<0.072	<0.072	<0.072	<0.077	<0.072	<0.088
FREON 11	<0.15	<0.16	<0.15	<0.15	<0.15	<0.15	<0.15	<0.16	<0.15	<0.19
1,1-DICHLOROETHANE	<0.11	<0.12	<0.11	<0.11	<0.11	<0.11	<0.11	<0.12	<0.11	<0.13
FREON 113	<0.21	<0.22	<0.21	<0.21	<0.21	<0.21	<0.21	<0.22	<0.21	<0.25
METHYLENE CHLORIDE	<0.095	<0.10	<0.095	<0.095	<0.095	<0.095	<0.095	<0.10	2.0	1.9
1,1-DICHLOROETHANE	<0.11	<0.12	<0.11	<0.11	<0.11	<0.11	<0.11	<0.12	<0.11	<0.13
cis-1,2-DICHLOROETHENE	<0.11	<0.12	<0.11	<0.11	<0.11	<0.11	<0.11	<0.12	0.13	0.15
CHLOROFORM	<0.13	<0.14	<0.13	<0.13	<0.13	<0.13	<0.13	<0.14	<0.13	<0.16
1,1,1-TRICHLOROETHANE	<0.15	0.43	0.43	<0.15	<0.15	0.16	<0.15	<0.16	<0.15	<0.18
CARBON TETRACHLORIDE	<0.17	<0.18	<0.17	<0.17	<0.17	<0.17	<0.17	<0.18	<0.17	<0.21
BENZENE	<0.088	<0.094	<0.088	<0.088	<0.088	0.19	0.30	<0.094	<0.088	<0.11
1,2-DICHLOROEHTANE	<0.11	<0.12	<0.11	<0.11	<0.11	<0.11	<0.11	<0.12	<0.11	<0.13
TRICHLOROETHENE	<0.15	<0.16	<0.15	<0.15	<0.15	<0.15	<0.15	<0.16	1.2	1.2
1,2-DICHLOROPROPANE	<0.13	<0.14	<0.13	<0.13	<0.13	<0.13	<0.13	<0.14	<0.13	<0.15
cis-1,3-DICHLOROPROPENE	<0.12	<0.13	<0.12	<0.12	<0.12	<0.12	<0.21	<0.13	<0.12	<0.15
TOLUENE	<0.10	0.14	0.16	<0.10	0.52	0.35	0.82	0.24	<0.10	<0.12
trans-1,3-DICHLOROPROPENE	<0.12	<0.13	<0.12	<0.12	<0.12	<0.12	<0.12	<0.13	<0.12	<0.15
1,1,2-TRICHLOROETHANE	<0.15	<0.16	<0.15	<0.15	<0.15	<0.15	<0.15	<0.16	<0.15	<0.18
TETRACHLOROETHENE	<0.18	<0.20	<0.18	<0.18	<0.18	<0.18	<0.18	<0.20	<0.18	<0.22
ETHYLENE DIBROMIDE	<0.21	<0.22	<0.21	<0.21	<0.21	<0.21	<0.21	<0.22	<0.21	<0.26
CHLOROBENZENE	<0.13	<0.14	<0.13	<0.13	<0.13	<0.13	<0.13	<0.14	<0.13	<0.15

TABLE 10A. (CONTINUED)

ETHYL BENZENE	<0.12	<0.13	<0.12	<0.12	<0.12	<0.12	<0.12	<0.13	<0.12	<0.14
m,P-XYLENE	<0.12	<0.13	<0.12	<0.12	<0.12	<0.12	0.34	<0.13	<0.12	<0.14
o-XYLENE	<0.12	<0.13	<0.12	<0.12	<0.12	<0.12	<0.12	<0.13	<0.12	<0.14
STYRENE	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	0.37	<0.12	<0.12	<0.14
1,1,2,2-TETRACHLOROETHANE	<0.19	<0.20	<0.19	<0.19	<0.19	<0.19	<0.19	<0.20	<0.19	<0.23
1,3,5-TRIMETHYLBENZENE	<0.13	<0.14	<0.13	<0.13	<0.13	<0.13	<0.13	<0.14	<0.13	<0.16
1,2,4-TRIMETHYLBENZENE	<0.13	<0.14	<0.13	<0.13	<0.13	0.18	0.18	<0.14	<0.13	<0.16
1,3-DICHLOROBENZENE	<0.16	<0.18	<0.16	<0.16	<0.16	<0.16	<0.16	<0.18	<0.16	<0.20
1,4-DICHLOROBENZENE	<0.16	<0.18	<0.16	<0.16	<0.16	<0.16	<0.16	<0.18	<0.16	<0.20
CHLOROTOLUENE	<0.14	<0.15	<0.14	<0.14	<0.14	<0.14	<0.14	<0.15	<0.14	<0.17
1,2-DICHLOROBENZENE	<0.16	<0.18	<0.16	<0.16	<0.16	<0.16	<0.16	<0.18	<0.16	<0.20
1,2,4-TRICHLOROBENZENE	<0.20	<0.22	<0.20	<0.20	<0.20	<0.20	<0.20	<0.22	<0.20	<0.25
HEXACHLOROBUTADIENE	<0.29	<0.31	<0.29	<0.29	<0.29	<0.29	<0.29	<0.31	<0.29	<0.35
PROPYLENE	<0.19	<0.20	<0.19	<0.19	<0.19	7.4	11	0.24	<0.19	<0.23
1,3-BUTADIENE	<0.24	<0.26	<0.24	<0.24	<0.24	<0.24	<0.24	<0.26	<0.24	<0.29
ACETONE	<0.39	2.5	2.8	1.1	<0.26	2.4	2.8	4.8	0.72	0.72
CARBON DISULFIDE	<0.34	<0.36	<0.34	<0.34	<0.34	<0.34	8.50	5.4	0.34	0.36J
2-PROPANOL	0.43	0.69	0.36	<0.27	<0.27	<0.27	<0.27	<0.29	<0.27	<0.33
trans-1,2-DICHLOROETHENE	<0.19	<0.46	<0.43	<0.43	<0.43	<0.43	<0.43	<0.46	<0.43	<0.53
VINYL ACETATE	<0.24	<0.41	<0.38	<0.38	<0.38	<0.38	<0.38	<0.41	<0.38	<0.47
CHLOROPRENE	0.39	<0.42	<0.40	<0.40	<0.40	<0.40	<0.40	<0.42	<0.40	<0.48
2-BUTANONE (MEK)	<0.34	0.43	<0.32	<0.32	<0.32	0.74	1.4	0.88	<0.32	<0.39
HEXANE	0.43	<0.41	<0.39	<0.39	<0.39	<0.39	<0.39	<0.41	<0.39	<0.47
TETRAHYDROFURAN	<0.43	<0.35	<0.32	<0.32	<0.32	<0.32	<0.32	<0.35	<0.32	<0.39
CYCLOHEXANE	<0.38	<0.40	<0.38	<0.38	<0.38	<0.38	<0.38	<0.40	<0.38	<0.46
1,4-DIOXANE	<0.40	<0.42	<0.39	<0.39	<0.39	<0.39	<0.39	<0.42	<0.39	<0.48
BROMODICHLOROMETHANE	<0.32	<0.79	<0.73	<0.73	<0.73	<0.73	<0.73	<0.79	<0.73	<0.89
4-METHYL-2-PETANONE	<0.39	<0.48	<0.45	<0.45	<0.45	<0.45	0.66	<0.48	<0.45	<0.54

TABLE 10A. (CONTINUED)

2-HEXANONE (MIBK)	<0.45	<0.48	<0.45	<0.45	<0.45	<0.45	<0.45	<0.48	<0.45	<0.54
DIBROMOCHLOROMETHANE	<0.93	<1.0	<0.93	<0.93	<0.93	<0.93	<0.93	<1.0	<0.93	<1.1
BROMOFORM	<1.1	<1.2	<1.1	<1.1	<1.1	<1.1	<1.1	<1.2	<1.1	<1.4
4-ETHYLTOLUENE	<0.54	<0.58	<0.54	<0.54	<0.54	<0.54	<0.54	<0.58	<0.54	<0.65
ETHANOL	4.0	5.1	<0.21	1.3	1.3	3.0	1.8	<0.22	1.0	1.2
METHYL t-BUTYL ETHER (MTBE)	<0.40	<0.42	<0.40	<0.40	<0.40	<0.40	<0.40	<0.42	<0.40	<0.48
HEPTANE	<0.45	<0.48	<0.45	<0.45	<0.45	<0.45	<0.45	<0.48	<0.45	<0.54
TNMHC*	48	47	36	22	22	44	61	40	7.7	8.8

FOOTNOTES:
PRE-TEST SYSTEM BLANK: C001, T001, N001, A001, F001, S001
LG. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C002/C003 (REPL), N005, T002/T003 (REPL), F002, A002, S002
LG. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C004, N017, T004, A003, S003/S004 (REPL), F003
LG. DAIRY #1, LIQUID POND: C005, N029, T005, S005, F004, A004
SM. DAIRY #1, UNDISTURBED STOCKPILE: C006, T006, N035, S006, F005, A005/A006 (REPL)
SM. DAIRY #1, DISTURBED STOCKPILE: C007, T007, N038, S007, F006/F007 (REPL), A007
SM. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C008, N050/N051 (REPL), T008, F008, S008, A008
SM. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C009, N075, T009, S010, A010
SPLIT SAMPLE: A009, S009, N061
B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION <u>NOT</u> PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 10B. SUMMARY OF VOC FLUX DATA, ug/m^2,min^{-1} (EPA TO-14) - WINTER TEST

COMPOUND	C001	C001-D
FREON 12	<0.14	<0.14
FREON 114	<0.19	<0.19
19LOROMETHANE	<0.056	<0.056
VINYL CHLORIDE	<0.070	<0.070
BROMOMETHANE	<0.11	<0.11
CHLOROETHANE	<0.072	<0.072
FREON 11	<0.15	<0.15
1,1-DICHLOROETHANE	<0.11	<0.11
FREON 113	<0.21	<0.21
METHYLENE CHLORIDE	<0.095	<0.095
1,1-DICHLOROETHANE	<0.11	<0.11
cis-1,2-DICHLOROETHENE	<0.11	<0.11
CHLOROFORM	<0.13	<0.13
1,1,1-TRICHLOROETHANE	<0.15	<0.15
CARBON TETRACHLORIDE	<0.17	<0.17
BENZENE	<0.088	<0.088
1,2-DICHLOROEHTANE	<0.11	<0.11
TRICHLOROETHENE	<0.15	<0.15
1,2-DICHLOROPROPANE	<0.13	<0.13
cis-1,3-DICHLOROPROPENE	<0.12	<0.12
TOLUENE	0.14	0.14
trans-1,3-DICHLOROPROPENE	<0.12	<0.12
1,1,2-TRICHLOROETHANE	<0.15	<0.15
TETRACHLOROETHENE	<0.18	<0.18
ETHYLENE DIBROMIDE	<0.21	<0.21
CHLOROBENZENE	<0.13	<0.13
ETHYL BENZENE	<0.12	<0.12
m,P-XYLENE	<0.12	<0.12
o-XYLENE	<0.12	<0.12
STYRENE	<0.12	<0.12
1,1,2,2-TETRACHLOROETHANE	<0.19	<0.19
1,3,5-TRIMETHYLBENZENE	<0.13	<0.13
1,2,4-TRIMETHYLBENZENE	<0.13	<0.13
1,3-DICHLOROBENZENE	<0.16	<0.16
1,4-DICHLOROBENZENE	<0.16	<0.16
CHLOROTOLUENE	<0.14	<0.14
1,2-DICHLOROBENZENE	<0.16	<0.16

TABLE 10B. (CONTINUED)

1,2,4-TRICHLOROBENZENE	<0.20	<0.20
HEXACHLOROBUTADIENE	<0.29	<0.29
PROPYLENE	<0.19	<0.19
1,3-BUTADIENE	<0.24	<0.24
ACETONE	5.0	4.7
CARBON DISULFIDE	<0.34	<0.34
2-PROPANOL	<0.27	<0.27
trans-1,2-DICHLOROETHENE	<0.43	<0.43
VINYL ACETATE	<0.38	<0.38
CHLOROPRENE	<0.40	<0.40
2-BUTANONE (MEK)	0.75	0.78
HEXANE	<0.39	<0.39
TETRAHYDROFURAN	<0.32	<0.32
CYCLOHEXANE	<0.38	<0.38
1,4-DIOXANE	<0.39	<0.39
BROMODICHLOROMETHANE	<0.73	<0.73
4-METHYL-2-PETANONE	<0.45	<0.45
2-HEXANONE (MIBK)	<0.45	<0.45
DIBROMOCHLOROMETHANE	<0.93	<0.93
BROMOFORM	<1.1	<1.1
4-ETHYLTOLUENE	<0.54	<0.54
ETHANOL	1.6	1.5
METHYL t-BUTYL ETHER (MTBE)	<0.40	<0.40
HEPTANE	<0.45	<0.45
TNMHC*	26	23

FOOTNOTES:
SM. DAIRY #3, MILK COW CORRAL, DRY RANDOM: C001, N146, T001, F001, A001, S001
SPLIT SAMPLE

B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 11A. SUMMARY OF REDUCED SUFLUR COMPOUND FLUX, $ug/m^2,min^{-1}$ (ASTM D-5504) - SUMMER TEST

COMPOUND	T001	T002	T003	T004	T005	T006	T007	T008	T009
HYDROGEN SULFIDE	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	0.71	<0.22
CARBONYL SULFIDE	<0.38	1.0	0.57	<0.38	0.42	<0.38	<0.38	<0.38	<0.38
METHYL MERCAPTAN	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	1.3	<0.31
DIMETHYL SULFIDE	<0.40	<0.40	<0.40	<0.40	<0.40	1.2	2.4	0.99	<0.40
CARBON DISULFIDE	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	1.1	<0.49
DIMETHYL DISULFIDE	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
ETHYL MERCAPTAN	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
ISOPROPYLMERCAPTAN	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49
tert-BUTYL MERCAPTAN	<0.58	<0.58	<0.58	<0.58	<0.58	<0.58	<0.58	<0.58	<0.58
n-PROPYLMERCAPTAN	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49
ETHYL METHYL SULFIDE	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49
THIOPHENE	<0.54	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49
ISOBUTYL MERCAPTAN	<0.58	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49
DIETHYL SULFIDE	<0.58	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49
n-BUTYLMERCAPTAN	<0.58	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49
3-METHYLTHIOPHENE	<0.63	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49
TETRAHYDROTHIOPHENE	<0.56	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49
2-ETHYLTHIOPHENE	<0.72	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49	<0.49
2,5-DIMETHYLTHIOPHENE	<0.72	0.77	0.74	<0.72	0.93	<0.72	<0.72	<0.72	<0.72
DIETHYL DISULFIDE	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78

FOOTNOTES:
PRE-TEST SYSTEM BLANK: C001, T001, N001, A001, F001, S001
LG. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C002/C003 (REPL), N005, T002/T003 (REPL), F002, A002, S002
LG. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C004, N017, T004, A003, S003/S004 (REPL), F003
LG. DAIRY #1, LIQUID POND: C005, N029, T005, S005, F004, A004
SM. DAIRY #1, UNDISTURBED STOCKPILE: C006, T006, N035, S006, F005, A005/A006 (REPL)
SM. DAIRY #1, DISTURBED STOCKPILE: C007, T007, N038, S007, F006/F007 (REPL), A007
SM. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C008, N050/N051 (REPL), T008, F008, S008, A008
SM. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C009, N075, T009, S010, A010
SPLIT SAMPLE: A009, S009, N061
B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION <u>NOT</u> PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 11B. SUMMARY OF REDUCED SUFLUR COMPOUND FLUX, $ug/m^2,min^{-1}$ (ASTM D-5504) - WINTER TEST

COMPOUND	T001
HYDROGEN SULFIDE	<0.22
CARBONYL SULFIDE	<0.38
METHYL MERCAPTAN	2.4
DIMETHYL SULFIDE	0.74
CARBON DISULFIDE	<0.49
DIMETHYL DISULFIDE	<0.60
ETHYL MERCAPTAN	<0.40
ISOPROPYLMERCAPTAN	<0.49
tert-BUTYL MERCAPTAN	<0.58
n-PROPYLMERCAPTAN	<0.49
ETHYL METHYL SULFIDE	<0.49
THIOPHENE	<0.54
ISOBUTYL MERCAPTAN	<0.58
DIETHYL SULFIDE	<0.58
n-BUTYLMERCAPTAN	<0.58
3-METHYLTHIOPHENE	<0.63
TETRAHYDROTHIOPHENE	<0.56
2-ETHYLTHIOPHENE	<0.72
2,5-DIMETHYLTHIOPHENE	<0.72
DIETHYL DISULFIDE	<0.78

FOOTNOTES:
SM. DAIRY #3, MILK COW CORRAL, DRY RANDOM: C001, N146, T001, F001, A001, S001
SPLIT SAMPLE

B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION <u>NOT</u> PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 12A. SUMMARY OF CARBONYL COMPOUND FLUX DATA, ug/m^2,min^{-1} (EPA TO-5) - SUMMER TEST

COMPOUND	F001	F002	F003	F003D	C004	C005	C005D	C006	C007	F008	C009
FORMALDEHYDE	0.76	1.3	1.8	1.8	2.9	1.0	1.1	2.9	1.7	5.7	3.2
ACETALDEHYDE	0.44	0.57	1.8	1.8	1.2	1.6B	1.8B	2.6B	2.3B	1.8B	1.1B
ACROLEIN	<0.13	<0.14	<0.14	<0.14	<0.12	<0.16	<0.16	<0.29	<0.26	<0.11	<0.11
PROPANAL	<0.13	0.23	0.30	0.30	0.24	0.24	0.25	<0.29	0.29	0.23	0.19
ACETONE	0.34B	<0.14	2.6B	2.5B	2.2B	3.3B	3.3B	7.0B	1.0B	0.24B	0.38B
CROTONALYDEHYDE	<0.13	<0.14	<0.14	<0.14	<0.12	<0.16	<0.16	<0.29	<0.26	<0.11	<0.11
ISOBUTYALDEHYDE (MEK)	<0.13	<0.14	0.20	<0.14	0.21	<0.16	<0.16	<0.29	<0.26	<0.11	<0.11
BENZALDEHYDE	<0.13	<0.14	<0.14	0.41	<0.12	<0.16	<0.16	<0.29	0.29	<0.11	<0.11
ISOPENTANAL	0.60	<0.14	0.44	0.41	0.41	0.81	0.83	0.76	4.7	4.1	3.0
PENTANAL	<0.13	<0.14	<0.14	<0.14	<0.12	<0.16	<0.16	<0.29	<0.26	<0.11	<0.11
m-TOLUALDEHYDE	0.40	<0.14	2.5	1.6	<0.12	6.7	6.4	7.3	<0.26	<0.11	<0.11
p-TOLUALDEHYDE	<0.13	<0.14	<0.14	<0.14	<0.12	<0.16	<0.16	<0.29	<0.26	<0.11	<0.11
o-TOLUALDEHYDE	<0.13	<0.14	<0.14	<0.14	<0.12	<0.16	<0.16	<0.29	<0.26	<0.11	<0.11
HEXANAL	<0.13	<0.14	<0.14	<0.14	<0.12	9.4	9.2	14	<0.26	<0.11	<0.11

FOOTNOTES:

PRE-TEST SYSTEM BLANK: C001, T001, N001, A001, F001, S001
LG. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C002/C003 (REPL), N005, T002/T003 (REPL), F002, A002, S002
LG. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C004, N017, T004, A003, S003/S004 (REPL), F003
LG. DAIRY #1, LIQUID POND: C005, N029, T005, S005, F004, A004
SM. DAIRY #1, UNDISTURBED STOCKPILE: C006, T006, N035, S006, F005, A005/A006 (REPL)
SM. DAIRY #1, DISTURBED STOCKPILE: C007, T007, N038, S007, F006/F007 (REPL), A007
SM. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C008, N050/N051 (REPL), T008, F008, S008, A008
SM. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C009, N075, T009, S010, A010
SPLIT SAMPLE: A009, S009, N061

B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 12B. SUMMARY OF CARBONYL COMPOUND FLUX DATA, $ug/m^2,min^{-1}$ (EPA TO-5) - WINTER TEST

COMPOUND	F001A/B	F002A/B-D
FORMALDEHYDE	1.7	1.7
ACETALDEHYDE	2.1B	2.1B
ACROLEIN	<0.13	<0.13
PROPANAL	2.3	2.3
ACETONE	0.58	0.61
CROTONALYDEHYDE	<0.13	<0.13
ISOBUTYALDEHYDE (MEK)	0.74	0.73
BENZALDEHYDE	<0.13	<0.13
ISOPENTANAL	6.4B	6.41B
PENTANAL	<0.13	<0.13
m-TOLUALDEHYDE	<0.13	<0.13
p-TOLUALDEHYDE	1.3	1.3
o-TOLUALDEHYDE	<0.13	<0.13
HEXANAL	3.4	3.9

FOOTNOTES:
SM. DAIRY #3, MILK COW CORRAL, DRY RANDOM: C001, N146, T001, F001, A001, S001
SPLIT SAMPLE

B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 13A. SUMMARY OF SVOC FLUX, $ug/m^2,min^{-1}$ (EPA 8270) - SUMMER TEST

COMPOUND	S001	S002	S003	S004	S005	S006	S007	S008	S009	S010	S010D
PHENOL	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
bis(2-CHLOROETHYL) ETHER	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
2-CHLOROPHENOL	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
1,3-DICHLOROBENZENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
1,4-DICHLOROBENZENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
1,2-DICHLOROBENZENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
2-METHYLPHENOL	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
bis(2-CHLOROISOPROPYL) ETHER	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
N-NITROSO-di-n-PROPYLAMINE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
4-METHYLPHENOL	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
HEXACHLOROETHANE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
NITROBENZENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
ISOPHORONE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
2-NITROPHENOL	<0.96	<0.91	<.10	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
2,4-DIMETHYLPHENOL	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
BENZOIC ACID	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
bis(2-CHLOROETHOXY) METHANE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
2,4-DICHLOROPHENOL	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
1,2,4-TRICHLOROBENZENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
NAPHTHALENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
4-CHLOROANILINE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
HEXACHLOROBUTADIENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
4-CHLORO-3-METHYLPHENOL	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
2-METHYLNAPHTHALENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
HEXACHLOROCYCLOPENTADIENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
2,4,6-TRICHLOROPHENOL	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86

TABLE 13A. (CONTINUED)

2,4,5-TRICHLOROPHENOL	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
2-CHLORONAPHTHALENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
2-NITROANILINE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
DIMETHYLPHTHALATE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
ACENAPHTHYLENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
2,6-DINITROTOLUENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
3-NITROANILINE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
ACENAPHTHENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
2,4-DINITROPHENOL	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
4-NITROPHENOL	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
2,4-DINITROTOLUENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
DIBENZOFURAN	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
DIETHYLPHTHALATE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
FLUORENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
4-CHLOROPHENYL-PHENYL ETHER	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
4-NITROANILINE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
4,6-DINITRO-2-METHYLPHENOL	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
N-NITROSODIPHENYLAMINE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
4-BROMOPHENYL-PHENYL ETHER	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
HEXACHLOROBENZENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
PENTACHLOROPHENOL	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
PHENANTHRENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
ANTHRACENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
di-n-BUTYLPHTHALATE	2.7B	2.2B	3.1B	0.096B	3.6B	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
FLUORANTHENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
PYRENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
BUTYLBENZYLPHTHALATE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
3,3'-DICHLOROBENZIDINE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86

TABLE 13A. (CONTINUED)

CHRYSENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
BENZO(A)ANTHRACENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
bis(2-ETHYLHEXYL)PHTHALATE	10	11	<1.0	<0.96	23	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
di-n-OCTYLPHTHALATE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
BENZO(b)FLUORANTHENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
BENZO(k)FLUORANTHENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
BENZO(a)PYRENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
INDENO(1,2,3-c,d)PYRENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
DIBENZ(a,h)ANTHRACENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86
BENZO(g,h,i)PERYLENE	<0.96	<0.91	<1.0	<0.96	<0.91	<1.1	<0.95	<0.81	<1.1	<0.86	<0.86

FOOTNOTES:
PRE-TEST SYSTEM BLANK: C001, T001, N001, A001, F001, S001
LG. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C002/C003 (REPL), N005, T002/T003 (REPL), F002, A002, S002
LG. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C004, N017, T004, A003, S003/S004 (REPL), F003
LG. DAIRY #1, LIQUID POND: C005, N029, T005, S005, F004, A004
SM. DAIRY #1, UNDISTURBED STOCKPILE: C006, T006, N035, S006, F005, A005/A006 (REPL)
SM. DAIRY #1, DISTURBED STOCKPILE: C007, T007, N038, S007, F006/F007 (REPL), A007
SM. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C008, N050/N051 (REPL), T008, F008, S008, A008
SM. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C009, N075, T009, S010, A010
SPLIT SAMPLE: A009, S009, N061
B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 13B. SUMMARY OF SVOC FLUX, ug/m^2,min^{-1} (EPA 8270) - WINTER TEST

COMPOUND	
PHENOL	<0.97
bis(2-CHLOROETHYL) ETHER	<0.97
2-CHLOROPHENOL	<0.97
1,3-DICHLOROBENZENE	<0.97
1,4-DICHLOROBENZENE	<0.97
1,2-DICHLOROBENZENE	<0.97
2-METHYLPHENOL	<0.97
bis(2-CHLOROISOPROPYL) ETHER	<0.97
N-NITROSO-di-n-PROPYLAMINE	<0.97
4-METHYLPHENOL	<0.97
HEXACHLOROETHANE	<0.97
NITROBENZENE	<0.97
ISOPHORONE	<0.97
2-NITROPHENOL	<0.97
2,4-DIMETHYLPHENOL	<0.97
BENZOIC ACID	<0.97
bis(2-CHLOROETHOXY) METHANE	<0.97
2,4-DICHLOROPHENOL	<0.97
1,2,4-TRICHLOROBENZENE	<0.97
NAPHTHALENE	1.3
4-CHLOROANILINE	<0.97
HEXACHLOROBUTADIENE	<0.97
4-CHLORO-3-METHYLPHENOL	<0.97
2-METHYLNAPHTHALENE	<0.97
HEXACHLOROCYCLOPENTADIENE	<0.97
2,4,6-TRICHLOROPHENOL	<0.97
2,4,5-TRICHLOROPHENOL	<0.97
2-CHLORONAPHTHALENE	<0.97
2-NITROANILINE	<0.97
DIMETHYLPHTHALATE	<0.97
ACENAPHTHYLENE	<0.97
2,6-DINITROTOLUENE	<0.97
3-NITROANILINE	<0.97
ACENAPHTHENE	<0.97
2,4-DINITROPHENOL	<0.97
4-NITROPHENOL	<0.97
2,4-DINITROTOLUENE	<0.97

TABLE 13B. (CONTINUED)	
DIBENZOFURAN	<0.97
DIETHYLPHTHALATE	<0.97
FLUORENE	<0.97
4-CHLOROPHENYL-PHENYL ETHER	<0.97
4-NITROANILINE	<0.97
4,6-DINITRO-2-METHYLPHENOL	<0.97
N-NITROSODIPHENYLAMINE	<0.97
4-BROMOPHENYL-PHENYL ETHER	<0.97
HEXACHLOROBENZENE	<0.97
PENTACHLOROPHENOL	<0.97
PHENANTHRENE	<0.97
ANTHRACENE	<0.97
di-n-BUTYLPHTHALATE	3.8
FLUORANTHENE	<0.97
PYRENE	<0.97
BUTYLBENZYLPHTHALATE	<0.97
3,3'-DICHLOROBENZIDINE	<0.97
CHRYSENE	<0.97
BENZO(A)ANTHRACENE	<0.97
bis(2-ETHYLHEXYL)PHTHALATE	18B
di-n-OCTYLPHTHALATE	<0.97
BENZO(b)FLUORANTHENE	<0.97
BENZO(k)FLUORANTHENE	<0.97
BENZO(a)PYRENE	<0.97
INDENO(1,2,3-c,d)PYRENE	<0.97
DIBENZ(a,h)ANTHRACENE	<0.97
BENZO(g,h,i)PERYLENE	<0.97

FOOTNOTES:
SM. DAIRY #3, MILK COW CORRAL, DRY RANDOM: C001, N146, T001, F001, A001, S001
SPLIT SAMPLE

B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 14A. SUMMARY OF AMINE COMPOUND FLUX DATA, $ug/m^2,min^{-1}$ (EPA TO-5) - SUMMER TEST

COMPOUND	A001	A002	A003	A004	A005	A006	A007	A008	A009	A010
DIETHYLAMINE	<19	<19	<20	<19	<30	<30	<20	<17	<16	<18
DIMETHYLAMINE	96	<19	<20	<19	<30	<30	<20	<17	<16	<18

FOOTNOTES:
PRE-TEST SYSTEM BLANK: C001, T001, N001, A001, F001, S001
LG. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C002/C003 (REPL), N005, T002/T003 (REPL), F002, A002, S002
LG. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C004, N017, T004, A003, S003/S004 (REPL), F003
LG. DAIRY #1, LIQUID POND: C005, N029, T005, S005, F004, A004
SM. DAIRY #1, UNDISTURBED STOCKPILE: C006, T006, N035, S006, F005, A005/A006 (REPL)
SM. DAIRY #1, DISTURBED STOCKPILE: C007, T007, N038, S007, F006/F007 (REPL), A007
SM. DAIRY #1, MILK COW CORRAL, DRY RANDOM: C008, N050/N051 (REPL), T008, F008, S008, A008
SM. DAIRY #1, DRY COW CORRAL, DRY RANDOM: C009, N075, T009, S010, A010
SPLIT SAMPLE: A009, S009, N061
B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 14B. **SUMMARY OF AMINE COMPOUND FLUX DATA, $ug/m^2,min^{-1}$ (EPA TO-5) - WINTER TEST**

COMPOUND	A001
DIETHYLAMINE	<2.6
DIMETHYLAMINE	<8.7

FOOTNOTES:
SM. DAIRY #3, MILK COW CORRAL, DRY RANDOM: C001, N146, T001, F001, A001, S001
SPLIT SAMPLE

B - COMPOUND FOUND IN LAB BLANK, BACKGROUND SUBTRACTION NOT PERFORMED
J - BELOW METHOD DETECTION LIMIT

TABLE 15A. CROSS REFERENCE FOR SPECIATED SAMPLE DATA - SUMMER TEST.

m²

Sample	Date Collected	Analyzed For	Time Collected	Dairy	Location	Area	No. of Cows	Surface Area
N-005	9/27/95	Ammonia	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620
A-002	9/27/95	Aliphatic Amines	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620
C-002/003	9/27/95	VOCs	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620
F-002	9/27/95	Aldehydes	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620
S-002	9/27/95	8270s & Ar. Amines	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620
T-002/003	9/27/95	Sulfurs	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620
N-017	9/28/95	Ammonia	11:48	Large #1	Dry Cow Corral	Dry, Random	145	7,897
A-003	9/28/95	Aliphatic Amines	11:48	Large #1	Dry Cow Corral	Dry, Random	145	7,897
C-004	9/28/95	VOCs	11:48	Large #1	Dry Cow Corral	Dry, Random	145	7,897
F-003	9/28/95	Aldehydes	11:48	Large #1	Dry Cow Corral	Dry, Random	145	7,897
S-003/004	9/28/95	8270s & Ar. Amines	11:48	Large #1	Dry Cow Corral	Dry, Random	145	7,897
T-004	9/28/95	Sulfurs	11:48	Large #1	Dry Cow Corral	Dry, Random	145	7,897
N-029	9/29/95	Ammonia	9:57	Large #1	Pond	Liquid	1542	4,450
A-004	9/29/95	Aliphatic Amines	9:57	Large #1	Pond	Liquid	1542	4,450
C-005	9/29/95	VOCs	9:57	Large #1	Pond	Liquid	1542	4,450
F-004	9/29/95	Aldehydes	9:57	Large #1	Pond	Liquid	1542	4,450
S-005	9/29/95	8270s & Ar. Amines	9:57	Large #1	Pond	Liquid	1542	4,450
T-005	9/29/95	Sulfurs	9:57	Large #1	Pond	Liquid	1542	4,450
N-035	10/4/95	Ammonia	17:03	Small #1	Stockpile	Undisturbed	360	5,340
A-005/006	10/4/95	Aliphatic Amines	17:03	Small #1	Stockpile	Undisturbed	360	5,340
C-006	10/4/95	VOCs	17:03	Small #1	Stockpile	Undisturbed	360	5,340
F-005	10/4/95	Aldehydes	17:03	Small #1	Stockpile	Undisturbed	360	5,340
S-006	10/4/95	8270s & Ar. Amines	17:03	Small #1	Stockpile	Undisturbed	360	5,340
T-006	10/4/95	Sulfurs	17:03	Small #1	Stockpile	Undisturbed	360	5,340
N-038	10/3/95	Ammonia	18:57	Small #1	Stockpile	Disturbed	360	5,340
A-007	10/3/95	Aliphatic Amines	18:57	Small #1	Stockpile	Disturbed	360	5,340
C-007	10/3/95	VOCs	18:57	Small #1	Stockpile	Disturbed	360	5,340
F-006/007	10/3/95	Aldehydes	18:57	Small #1	Stockpile	Disturbed	360	5,340

TABLE 15A. CONTINUED.

Sample	Date Collected	Analyzed For	Time Collected	Dairy	Location	Area	No. of Cows	Surface Area
S-007	10/3/95	8270s & Ar. Amines	18:57	Small #1	Stockpile	Disturbed	360	5,340
T-007	10/3/95	Sulfurs	18:57	Small #1	Stockpile	Disturbed	360	5,340
N-050	10/4/95	Ammonia	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298
A-008	10/4/95	Aliphatic Amines	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298
C-008	10/4/95	VOCs	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298
F-008	10/4/95	Aldehydes	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298
S-008	10/4/95	8270s & Ar. Amines	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298
T-008	10/4/95	Sulfurs	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298
N-061	10/4/95	Ammonia	15:35	Small #1	Milk Cow Corral	Water Trough	32	19
A-009	10/4/95	Aliphatic Amines	15:35	Small #1	Milk Cow Corral	Water Trough	32	19
S-009	10/4/95	8270s & Ar. Amines	15:35	Small #1	Milk Cow Corral	Water Trough	32	19
N-075	10/5/95	Ammonia	8:50	Small #1	Dry Cow Corral	Feeder	45	63
A-010	10/5/95	Aliphatic Amines	8:50	Small #1	Dry Cow Corral	Feeder	45	63
C-009	10/5/95	VOCs	8:50	Small #1	Dry Cow Corral	Feeder	45	63
F-009	10/5/95	Aldehydes	8:50	Small #1	Dry Cow Corral	Feeder	45	63
S-010	10/5/95	8270s & Ar. Amines	8:50	Small #1	Dry Cow Corral	Feeder	45	63
T-009	10/5/95	Sulfurs	8:50	Small #1	Dry Cow Corral	Feeder	45	63

TABLE 15B. CROSS REFERENCE FOR SPECIATED SAMPLE DATA - WINTER TEST.

Sample	Date Collected	Analyzed For	Time Collected	Dairy	Location	Area	No. of Cows	Surface Area
N-146	12/14/95	Ammonia	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460
A-001	12/14/95	Aliphatic Amines	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460
C-001	12/14/95	VOCs	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460
F-001	12/14/95	Aldehydes	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460
S-001	12/14/95	8270s & Ar. Amines	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460
T-001	12/14/95	Sulfurs	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460

TABLE 16A. VOC FLUX DATA ABOVE METHOD DETECTION LIMIT - SUMMER TEST.

Field Sample ID	Sample Date	Analyz-ed For	Time Collected	Dairy	Location	Area	No. of Cows	Sur. Area (m2)	Dil. Fac-tor	Det. Limit (ppbv)	Amt. (ppbv)	Amt (ug/ m3)	Flux (ug/(m2* min))
Chloromethane													
C-002	9/27/95	VOCs	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620	1.5	0.75	2.3	4.8	0.18
C-006	10/3/95	VOCs	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.4	0.70	7.7	16	0.62
C-007	10/3/95	VOCs	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.4	0.70	26	54	2.1
Methylene Chloride													
C-009	10/5/95	VOCs	8:50	Small #1	Dry Cow Corral	Feeder	45	63	1.4	0.70	15	53	2.0
cis-1,2-Dichloroethene													
C-009	10/5/95	VOCs	8:50	Small #1	Dry Cow Corral	Feeder	45	63	1.4	0.70	0.84	3.4	0.13
1,1,1-Trichloroethane													
C-002	9/27/95	VOCs	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620	1.5	0.75	2.0	11	0.43
C-006	10/3/95	VOCs	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.4	0.70	1.5	4.9	0.19
Benzene													
C-006	10/3/95	VOCs	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.4	0.70	0.76	4.2	0.16
C-007	10/3/95	VOCs	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.4	0.70	2.4	7.8	0.30
Trichloroethene													
C-009	10/5/95	VOCs	8:50	Small #1	Dry Cow Corral	Feeder	45	63	1.4	0.70	5.5	30	1.2
Toluene													
C-002	9/27/95	VOCs	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620	1.5	0.75	0.93	3.6	0.14
C-005	9/29/95	VOCs	9:57	Large #1	Pond	Liquid	1542	4,450	1.4	0.70	3.5	13	0.52
C-006	10/3/95	VOCs	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.4	0.70	2.4	9.2	0.35
C-007	10/3/95	VOCs	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.4	0.70	5.6	21	0.82
C-008	10/4/95	VOCs	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.5	0.75	1.6	6.1	0.24
m,p-Xylene													
C-007	10/3/95	VOCs	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.4	0.70	2.0	8.8	0.34

TABLE 16A. CONTINUED.

Field Sample ID	Sample Date	Analyzed For	Time Collected	Dairy	Location	Area	No. of Cows	Sur. Area (m2)	Dil. Factor	Det. Limit (ppbv)	Amt. (ppbv)	Amt (ug/m3)	Flux (ug/(m2*min))
Styrene													
C-006	10/3/95	VOCs	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.4	0.70	0.75	3.2	0.12
C-007	10/3/95	VOCs	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.4	0.70	2.2	9.5	0.37
1,2,4-Trimethylbenzene													
C-006	10/3/95	VOCs	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.4	0.70	0.94	4.7	0.18
C-007	10/3/95	VOCs	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.4	0.70	0.94	4.7	0.18
Propylene													
C-006	10/3/95	VOCs	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.4	2.80	110	190	7.4
C-007	10/3/95	VOCs	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.4	2.80	160	280	11
C-008	10/4/95	VOCs	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.5	3.00	3.6	6.3	0.24
Acetone													
C-001	9/26/95	VOCs	21:30		Chamber Blank				1.4	2.80	4.2	10	0.39
C-002	9/27/95	VOCs	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620	1.5	3.00	27	65	2.5
C-004	9/28/95	VOCs	11:48	Large #1	Dry Cow Corral	Dry, Random	145	7,897	1.4	2.80	12	29	1.1
C-006	10/3/95	VOCs	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.4	2.80	26	63	2.4
C-007	10/3/95	VOCs	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.4	2.80	30	72	2.8
C-008	10/4/95	VOCs	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.5	3.00	52	120	4.8
C-009	10/5/95	VOCs	8:50	Small #1	Dry Cow Corral	Feeder	45	63	1.4	2.80	7.8	19	0.72
Carbon Disulfide													
C-007	10/3/95	VOCs	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.4	2.80	4.1	13	0.50
C-008	10/4/95	VOCs	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.5	3.00	44	140	5.4
C-009	10/5/95	VOCs	8:50	Small #1	Dry Cow Corral	Feeder	45	63	1.4	2.80	2.8	8.9	0.34
2-Propanol													
C-001	9/26/95	VOCs	21:30		Chamber Blank				1.4	2.80	4.5	11	0.43
C-002	9/27/95	VOCs	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620	1.5	3.00	7.2	18	0.69

TABLE 16A. CONTINUED.

Field Sample ID	Sample Date	Analyzed For	Time Collected	Dairy	Location	Area	No. of Cows	Sur. Area (m2)	Dil. Factor	Det. Limit (ppbv)	Amt. (ppbv)	Amt (ug/m3)	Flux (ug/(m2*min))
2-Butanone (MEK)													
C-002	9/27/95	VOCs	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620	1.5	3.00	3.7	11	0.43
C-006	10/3/95	VOCs	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.4	2.80	6.4	19	0.74
C-007	10/3/95	VOCs	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.4	2.80	12	36	1.4
C-008	10/4/95	VOCs	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.5	3.00	7.6	23	0.88
4-methyl-2-Pentanone													
C-007	10/3/95	VOCs	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.4	2.80	4.1	17	0.66
Ethanol													
C-001	9/26/95	VOCs	21:30		Chamber Blank				1.4	2.80	54	100	4
C-002	9/27/95	VOCs	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620	1.5	3.00	69	130	5.1
C-004	9/28/95	VOCs	11:48	Large #1	Dry Cow Corral	Dry, Random	145	7,897	1.4	2.80	18	34	1.3
C-006	10/3/95	VOCs	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.4	2.80	41	78	3.0
C-007	10/3/95	VOCs	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.4	2.80	25	48	1.8
C-009	10/5/95	VOCs	8:50	Small #1	Dry Cow Corral	Feeder	45	63	1.4	2.80	14	27	1.0
TNMHC*													
C-001	9/26/95	VOCs	21:30		Chamber Blank				1.4	7.00	350	1200	48
C-002	9/27/95	VOCs	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620	1.5	7.50	340	1200	47
C-004	9/28/95	VOCs	11:48	Large #1	Dry Cow Corral	Dry, Random	145	7,897	1.4	7.00	160	570	22
C-005	9/29/95	VOCs	9:57	Large #1	Pond	Liquid	1542	4,450	1.4	7.00	160	570	22
C-006	10/3/95	VOCs	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.4	7.00	320	1100	44
C-007	10/3/95	VOCs	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.4	7.00	440	1600	61
C-008	10/4/95	VOCs	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.5	7.50	290	1000	40
C-009	10/5/95	VOCs	8:50	Small #1	Dry Cow Corral	Feeder	45	63	1.4	7.00	56	200	7.7
1-Butanol													
C-001	9/26/95	VOCs	21:30		Chamber Blank				1.4	N/A	4.5	14	0.53
C-002	9/27/95	VOCs	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620	1.5	N/A	5.9	18	0.70

*Total Non-Methane Hydrocarbons referenced to Hexane (MW=86)

TABLE 16B. VOC FLUX DATA ABOVE METHOD DETECTION LIMIT - WINTER TEST.

Field Sample ID	Sample Date	Analyzed For	Time Collected	Dairy	Location	Area	No. of Cows	Sur. Area (m2)	Total Sample Vol. (m3)	Dil. Fac-tor	Det. Limit (ppbv)	Amt. (ppbv)	Amt (ug/ m3)	Flux (ug/(m2* min))
Toluene														
C-001	12/14/95	VOCs	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	N/A	1.4	0.70	0.92	3.5	0.14
Acetone														
C-001	12/14/95	VOCs	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	N/A	1.4	2.80	54	130	5
2-Butanone (MEK)														
C-001	12/14/95	VOCs	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	N/A	1.4	2.80	6.5	19	0.75
TNMHC*														
C-001	12/14/95	VOCs	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	N/A	1.4	7.00	190	680	26

*Total Non-Methane Hydrocarbons referenced to Hexane (MW=86)

TABLE 17A. REDUCED SULFUR COMPOUND FLUX DATA ABOVE METHOD DETECTION LIMIT - SUMMER TEST.

Field Sample ID	Sample Date	Analyzed For	Time Coll.	Dairy	Location	Area	No. of Cows	Sur. Area (m2)	Dil. Factor	Det. Limit (ppbv)	Amt. (ppbv)	Amt (ug/ m3)	Flux (ug/(m2* min))
Hydrogen Sulfide													
T-008	10/4/95	Sulfur Gases	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.0	4.0	13	18	0.71
Carbonyl Sulfide													
T-002	9/27/95	Sulfur Gases	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620	1.0	4.0	11	27	1.0
T-005	9/29/95	Sulfur Gases	9:57	Large #1	Pond	Liquid	1542	4,450	1.0	4.0	4.4	11	0.42
Methyl Mercaptan													
T-008	10/4/95	Sulfur Gases	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.0	4.0	17	34	1.3
Dimethyl Sulfide													
T-006	10/3/95	Sulfur Gases	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.0	4.0	12	31	1.2
T-007	10/3/95	Sulfur Gases	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.0	4.0	24	62	2.4
T-008	10/4/95	Sulfur Gases	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.0	4.0	10	26	0.99
Carbon Disulfide													
T-008	10/4/95	Sulfur Gases	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.0	4.0	8.8	28	1.1
2,5-Dimethylthiophene													
T-002	9/27/95	Sulfur Gases	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620	1.0	4.0	4.3	20	0.77
T-005	9/29/95	Sulfur Gases	9:57	Large #1	Pond	Liquid	1542	4,450	1.0	4.0	5.2	24	0.93

TABLE 17B. REDUCED SULFUR COMPOUND FLUX DATA ABOVE METHOD DETECTION LIMIT - WINTER TEST.

Field Sample ID	Sample Date	Analyzed For	Time Coll.	Dairy	Location	Area	No. of Cows	Sur. Area (m2)	Total Sample Vol. (m3)	Dil. Factor	Det. Limit (ppbv)	Amt. (ppbv)	Amt (ug/m3)	Flux (ug/(m2*min))
Methyl Mercaptan														
T-001	12/14/95	Sulfurs	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	N/A	1.0	4.0	31	62	2.4
Dimethyl Sulfide														
T-001	12/14/95	Sulfurs	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	N/A	1.0	4.0	7.4	19	0.74

TABLE 18A. CARBONYL COMPOUND FLUX DATA ABOVE METHOD DETECTION LIMIT - SUMMER TEST.

Field Sample ID	Sample Date	Analyzed For	Time Coll.	Dairy	Location	Area	No. of Cows	Sur. Area (m2)	Dil. Fac-tor	Det. Limit (ug)	Amt. (ug)	Amt (ug/ m3)	Flux (ug/(m2 *min))	(ppbv)
Formaldehyde														
rip Blk	N/A	TO-5	N/A						1.0	0.10	0.4	13	0.51	10
F-001	9/26/95	TO-5	21:30		Chamber Blank				1.0	0.10	0.6	20	0.76	16
F-002	9/27/95	TO-5	14:46	Large #1	Milk Cow Corral	Dry, Rando	165	7,620	1.0	0.10	0.95	34	1.3	27
F-003	9/28/95	TO-5	11:48	Large #1	Dry Cow Corral	Dry, Rando	145	7,897	1.0	0.10	1.3	46	1.8	37
F-004	9/29/95	TO-5	9:57	Large #1	Pond	Liquid	1542	4,450	1.0	0.10	2.3	75	2.9	60
rip Blk	N/A	TO-5	N/A						1.0	0.10	1.4	47	1.80	37
F-005	10/3/95	TO-5	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.0	0.10	0.66	27	1.0	22
F-006	10/3/95	TO-5	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.0	0.10	1.0	76	2.9	61
F-008	10/4/95	TO-5	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.0	0.10	5.0	150	5.7	120
F-009	10/5/95	TO-5	8:50	Small #1	Dry Cow Corral	Feeder	45	63	1.0	0.10	2.8	82	3.2	66
Acetaldehyde														
rip Blk	N/A	TO-5	N/A						1.0	0.10	0.15	5	0.19	2.7
F-001	9/26/95	TO-5	21:30		Chamber Blank				1.0	0.10	0.35	12	0.44	6.6
F-002	9/27/95	TO-5	14:46	Large #1	Milk Cow Corral	Dry, Rando	165	7,620	1.0	0.10	0.42	15	0.57	8.2
F-003	9/28/95	TO-5	11:48	Large #1	Dry Cow Corral	Dry, Rando	145	7,897	1.0	0.10	1.3	46	1.8	25
F-004	9/29/95	TO-5	9:57	Large #1	Pond	Liquid	1542	4,450	1.0	0.10	0.94	30	1.2	16
F-005	10/3/95	TO-5	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.0	0.10	0.98 B	40 B	1.6 B	22 B
F-006	10/3/95	TO-5	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.0	0.10	0.88 B	67 B	2.6 B	36 B
F-008	10/4/95	TO-5	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.0	0.10	1.6 B	47 B	1.8 B	26 B
F-009	10/5/95	TO-5	8:50	Small #1	Dry Cow Corral	Feeder	45	63	1.0	0.10	0.97 B	28 B	1.1 B	16 B
Acetone														
F-005	10/3/95	TO-5	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.0	0.10	2.1 B	87 B	3.3 B	36 B
F-006	10/3/95	TO-5	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.0	0.10	2.4 B	180 B	7.0 B	75 B

TABLE 18A. CONTINUED.

Field Sample ID	Sample Date	Analyzed For	Time Coll.	Dairy	Location	Area	No. of Cows	Sur. Area (m2)	Dil. Fac-tor	Det. Limit (ug)	Amt. (ug)	Amt (ug/m3)	Flux (ug/(m2 *min))	(ppbv)
Propanal														
F-003	9/28/95	TO-5	11:48	Large #1	Dry Cow Corral	Dry, Rando	145	7,897	1.0	0.10	0.22	7.8	0.30	3.2
F-004	9/29/95	TO-5	9:57	Large #1	Pond	Liquid	1542	4,450	1.0	0.10	0.19	6.2	0.24	2.6
rip Blk	N/A	TO-5	N/A						1.0	0.10	0.15	5.0	0.19	2.1
F-005	10/3/95	TO-5	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.0	0.10	0.15	6.2	0.24	2.6
F-008	10/4/95	TO-5	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.0	0.10	0.20	5.9	0.23	2.4
F-009	10/5/95	TO-5	8:50	Small #1	Dry Cow Corral	Feeder	45	63	1.0	0.10	0.17	5.0	0.19	2.1
Isobutyraldehyde/Methyl Ethyl Ketone*														
F-003	9/28/95	TO-5	11:48	Large #1	Dry Cow Corral	Dry, Rando	145	7,897	1.0	0.10	0.15	5.3	0.20	1.8
F-004	9/29/95	TO-5	9:57	Large #1	Pond	Liquid	1542	4,450	1.0	0.10	0.17	5.5	0.21	1.8
Benzaldehyde														
rip Blk	N/A	TO-5	N/A						1.0	0.10	0.14	4.7	0.18	1.0
Isopentanal														
rip Blk	N/A	TO-5*	N/A						1.0	0.10	0.19	6	0.24	1.8
F-001	9/26/95	TO-5*	21:30		Chamber Blank				1.0	0.10	0.47	15	0.60	4.2
F-003	9/28/95	TO-5*	11:48	Large #1	Dry Cow Corral	Dry, Rando	145	7,897	1.0	0.10	0.32	11	0.44	3.1
F-004	9/29/95	TO-5*	9:57	Large #1	Pond	Liquid	1542	4,450	1.0	0.10	0.33	11	0.41	3.1
rip Blk	N/A	TO-5*	N/A						1.0	0.10	2.3	77	3.0	21
F-005	10/3/95	TO-5*	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.0	0.10	0.51	21	0.81	5.9
F-006	10/3/95	TO-5*	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.0	0.10	0.26	20	0.76	5.5
F-008	10/4/95	TO-5*	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.0	0.10	3.6	110	4.1	30
F-009	10/5/95	TO-5*	8:50	Small #1	Dry Cow Corral	Feeder	45	63	1.0	0.10	2.7	79	3.0	22

TABLE 18A. CONTINUED.

Field Sample ID	Sample Date	Analyzed For	Time Coll.	Dairy	Location	Area	No. of Cows	Sur. Area (m2)	Dil. Fac-tor	Det. Limit (ug)	Amt. (ug)	Amt (ug/ m3)	Flux (ug/(m2 *min))	(ppbv)
m-Tolualdehyde														
F-001	9/26/95	TO-5*	21:30		Chamber Blank				1.0	0.10	0.32	10	0.40	2.0
F-003	9/28/95	TO-5*	11:48	Large #1	Dry Cow Corral	Dry, Rando	145	7,897	1.0	0.10	1.8	64	2.50	13
F-004	9/29/95	TO-5*	9:57	Large #1	Pond	Liquid	1542	4,450	1.0	0.10	2.8	91	3.5	18
F-005	10/3/95	TO-5*	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.0	0.10	4.2	170	6.7	35
F-006	10/3/95	TO-5*	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.0	0.10	2.5	190	7.3	38
Hexanal														
F-005	10/3/95	TO-5*	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.0	0.10	5.9	240	9.4	58
F-006	10/3/95	TO-5*	18:57	Small #1	Stockpile	Disturbed	360	5,340	1.0	0.10	4.7	360	14	86

*Isobutyraldehyde and Methyl Ethyl Ketone coelute

B = Compound present in laboratory blank. At least a portion of the concentration detected is likely due to laboratory contamination.

TABLE 18B. CARBONYL COMPOUND FLUX DATA ABOVE METHOD DETCION LIMIT - WINTER TEST.

Field Sample ID	Sample Date	Analyzed For	Time Coll.	Dairy	Location	Area	No. of Cows	Sur. Area (m2)	Dil. Fac-tor	Det. Limit (ug)	Amt. (ug)	Amt (ug/m3)	Flux (ug/(m2*min))	(ppbv)
Formaldehyde														
Trip Blank	N/A	TO-5	N/A						1.0	0.10	0.12	4.0	0.16	3.2
F-001	12/14/95	Aldehydes	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	1.0	0.10	1.3	44	1.7	35
Acetaldehyde														
Trip Blank	N/A	TO-5	N/A						1.0	0.10	0.33B	11B	0.43B	6.1B
F-001	12/14/95	Aldehydes	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	1.0	0.10	1.6B	54B	2.1B	30B
Acetone														
Trip Blank	N/A	TO-5	N/A						1.0	0.10	0.20	6.8	0.26	2.8
F-001	12/14/95	Aldehydes	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	1.0	0.10	1.8	61	2.3	25
Propanal														
Trip Blank	N/A	TO-5	N/A						1.0	0.10	0.12	4.0	0.16	1.7
F-001	12/14/95	Aldehydes	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	1.0	0.10	0.45	15	0.58	6.3
Isobutyraldehyde/Methyl Ethyl Ketone*														
F-001	12/14/95	Aldehydes	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	1.0	0.10	0.57	19	0.74	6.4
Isopentanal														
Trip Blank	N/A	TO-5	N/A						1.0	0.10	1.0B	34B	1.3B	9.4B
F-001	12/14/95	Aldehydes	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	1.0	0.10	4.9B	160B	6.4B	46B
m-Tolualdehyde														
F-001	12/14/95	Aldehydes	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	1.0	0.10	0.98	33	1.3	6.8
Hexanal														
Trip Blank	N/A	TO-5	N/A						1.0	0.10	0.29	9.8	0.38	2.4
F-001	12/14/95	Aldehydes	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	1.0	0.10	2.6	88	3.4	21

*Isobutyraldehyde and Methyl Ethyl Ketone coelute

B = Compound present in laboratory blank. At least a portion of the concentration detected is likely due to laboratory contamination.

TABLE 19A. SVOC/AROMATIC AMINE FLUX DATA ABOVE METHOD DETECTION LIMIT - SUMMER TEST.

Field Sample ID	Sample Date	Analyzed For	Time Coll.	Dairy	Location	Area	No. of Cows	Sur. Area (m2)	Dil. Factor	Det. Limit (ug)	Amt. (ug)	Amt (ug/m3)	Flux (ug/(m2 *min))	(ppbv)
bis(2-Ethylhexyl)phthalate														
S-001	9/26/95	SVOCs*	21:30		Chamber Blank				1.0	1.00	11	270	10	17
S-002	9/27/95	SVOCs*	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620	1.0	1:00	12	280	11	17
S-005	9/29/95	SVOCs*	9:57	Large #1	Pond	Liquid	1542	4,450	1.0	1.00	25	590	23	36
4-methyl-1,2-Benzenediamine														
S-006	10/3/95	SVOCs*	17:03	Small #1	Stockpile	Undisturbed	360	5,340	1.0	N/A	19	552	21.3	
2-methyl-1,3-Benzenediamine														
S-008	10/4/95	SVOCs*	11:39	Small #1	Milk Cow Corral	Dry Random	32	6,298	1.0	N/A	4.7	99	3.8	
S-009	10/4/95	SVOCs*	15:35	Small #1	Milk Cow Corral	Water Trough	32	19	1.0	N/A	11	308	11.9	
S-010	10/5/95	SVOCs*	8:50	Small #1	Dry Cow Corral	Feeder	45	63	1.0	N/A	11	246	9.5	
7-methyl-1,2,4-Triazolo[4,3-a]pyridin-3-amine														
S-009	10/4/95	SVOCs*	15:35	Small #1	Milk Cow Corral	Water Trough	32	19	1.0	N/A	6.6	185	7.1	
S-010	10/5/95	SVOCs*	8:50	Small #1	Dry Cow Corral	Feeder	45	63	1.0	N/A	6.1	136	5.2	
Unkown Aromatic Amines														
rip Blan	N/A	SVOCs*	N/A						1.0	N/A	6.0	156	6.0	
rip Blan	N/A	SVOCs*	N/A						1.0	N/A	4.7	122	4.7	
S-001	9/27/95	SVOCs*	21:30		Chamber Blank				1.0	N/A	4.2	104	4.0	
S-001	9/27/95	SVOCs*	21:30		Chamber Blank				1.0	N/A	4.6	114	4.4	
S-002	9/27/95	SVOCs*	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620	1.0	N/A	4.2	99	3.8	
S-002	9/27/95	SVOCs*	14:46	Large #1	Milk Cow Corral	Dry, Random	165	7,620	1.0	N/A	4.4	104	4.0	
S-003	9/28/95	SVOCs*	11:48	Large #1	Dry Cow Corral	Dry, Random	145	7,897	1.0	N/A	4.3	112	4.3	
S-003	9/28/95	SVOCs*	11:48	Large #1	Dry Cow Corral	Dry, Random	145	7,897	1.0	N/A	4.8	125	4.8	
S-003	9/28/95	SVOCs*	11:48	Large #1	Dry Cow Corral	Dry, Random	145	7,897	1.0	N/A	5.5	143	5.5	
S-005	9/29/95	SVOCs*	9:57	Large #1	Pond	Liquid	1542	4,450	1.0	N/A	5.9	140	5.4	
S-005	9/29/95	SVOCs*	9:57	Large #1	Pond	Liquid	1542	4,450	1.0	N/A	5.0	118	4.6	
*Includes Aromatic Amines (as TICS)														

TABLE 19B. SVOC/AROMATIC AMINE FLUX DATA ABOVE METHOD DETECTION LIMIT - WINTER TEST.

Field Sample ID	Sample Date	Analyzed For	Time Coll.	Dairy	Location	Area	No. of Cows	Sur. Area (m2)	Dil. Factor	Det. Limit (ug)	Amt. (ug)	Amt (ug/m3)	Flux (ug/(m2 *min))	(ppbv)
Naphthalene														
S-001	12/14/95	8270s & Ar. Amines	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	1.0	**1.00**	**1.3**	**33**	**1.3**	**6.2**
di-n-Butylphthalate														
S-001	12/14/95	8270s & Ar. Amines	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	1.0	**1.00**	**3.9**	**98**	**3.8**	**8.5**
bis(2-Ethylhexyl)phthalate														
S-001	12/14/95	8270s & Ar. Amines	13:22	Small #3	Milk Cow Corral	Dry, Random	200	8460	1.0	**1.00**	**19B**	**480B**	**18B**	**30B**

B = Compound present in laboratory blank. At least a portion of the concentration detected is likely due to laboratory contamination.

TABLE 20. AMMONIA FLUX DATA PER HOUR AND NORMALIZATION FACTORS - ALL TEST DATA.

Time Collected	Hour	Flux (ug/(m2*min))	Normalization Factor
145	100	**530**	**0.97**
	200		**1.12**
340	300	**410**	**1.26**
	400		**1.37**
542	500	**350**	**1.47**
	600		**1.37**
740	700	**410**	**1.26**
	800		**1.00**
936	900	**700**	**0.74**
	1000		**0.67**
1142	1100	**860**	**0.60**
	1200		**0.60**
1333	1300	**860**	**0.60**
	1400		**1.16**
1548	1500	**300**	**1.72**
	1600		**1.75**
1740	1700	**290**	**1.78**
	1800		**1.61**
1947	1900	**360**	**1.43**
	2000		**1.21**
2140	2100	**520**	**0.99**
	2200		**0.93**
2342	2300	**600**	**0.86**
Average		**516**	

Note: Samples were collected every two hours (during the odd numbered hours). The normalization factors for the even numbered hours were calculated by averaging the factors for the preceding and following (odd) hours.

TABLE 21A. DATA SPECIFIC NORMALIZATION FACTORS - SUMMER TEST.

Field Sample I.D.	Sample Date	Time Collected	Normalization Factor
N-120	10/7/95	7:45	1.26
N-121	10/7/95	7:47	1.26
N-046	10/5/95	8:00	1.00
N-013	9/28/95	8:03	1.00
N-014	9/28/95	8:12	1.00
N-122	10/7/95	8:33	1.00
N-098	10/6/95	8:34	1.00
N-123	10/7/95	8:34	1.00
N-097	10/7/95	8:35	1.00
N-095/096 Ave.	10/7/95	8:38	1.00
N-074	10/6/95	8:43	1.00
N-075	10/6/95	8:50	1.00
N-047	10/5/95	8:58	1.00
N-070	10/6/95	9:01	0.74
N-124	10/7/95	9:16	0.74
N-099	10/6/95	9:24	0.74
N-125	10/7/95	9:28	0.74
N-100	10/6/95	9:30	0.74
N-016	9/28/95	9:36	0.74
N-101/102 Ave.	10/6/95	9:37	0.74
N-076	10/6/95	9:45	0.74
N-049	10/5/95	9:51	0.74
N-029	9/29/95	9:57	0.74
N-077	10/6/95	10:04	0.67
N-126 Ave.	10/7/95	10:07	0.67
N-103	10/6/95	10:14	0.67
N-127	10/7/95	10:21	0.67
N-104	10/6/95	10:25	0.67
N-105	10/6/95	10:30	0.67
N-078	10/6/95	10:40	0.67
N-079	10/6/95	10:49	0.67

TABLE 21A. CONTINUED.

Field Sample I.D.	Sample Date	Time Collected	Normalization Factor
N-080	10/6/95	11:18	0.60
N-129	10/7/95	11:23	0.60
N-030 Ave.	9/29/95	11:35	0.60
N-050/051 Ave.	10/5/95	11:39	0.60
N-106 Ave.	10/6/95	11:40	0.60
N-107	10/6/95	11:44	0.60
N-108	10/6/95	11:45	0.60
N-081	10/6/95	11:46	0.60
N-017	9/28/95	11:48	0.60
N-018	9/28/95	11:52	0.60
N-082	10/6/95	11:54	0.60
N-052	10/5/95	12:01	0.60
N-130	10/7/95	12:12	0.60
N-109	10/6/95	12:30	0.60
N-110	10/6/95	12:33	0.60
N-111	10/6/95	12:36	0.60
N-003	9/27/95	12:39	0.60
N-053	10/5/95	13:02	0.60
N-002	9/27/95	13:05	0.60
N-019	9/28/95	13:06	0.60
N-020	9/28/95	13:20	0.60
N-054/055 Ave.	10/5/95	13:20	0.60
N-057	10/5/95	13:56	0.60
N-022	9/28/95	14:15	1.16
N-058/059 Ave.	10/5/95	14:27	1.16
N-004	9/27/95	14:28	1.16
N-021	9/28/95	14:37	1.16
N-005	9/27/95	14:46	1.16

TABLE 21A. CONTINUED.

Field Sample I.D.	Sample Date	Time Collected	Normalization Factor
N-112	10/6/95	15:00	1.72
N-113	10/6/95	15:08	1.72
N-084	10/6/95	15:15	1.72
N-023	9/28/95	15:20	1.72
N-006/007 Ave.	9/27/95	15:22	1.72
N-060	10/5/95	15:24	1.72
N-061	10/5/95	15:35	1.72
N-024	9/28/95	15:43	1.72
N-114	10/6/95	15:45	1.72
N-115	10/6/95	15:56	1.72
N-085	10/6/95	15:57	1.72
N-008	9/27/95	16:08	1.75
N-063	10/5/95	16:12	1.75
N-087 Ave.	10/6/95	16:24	1.75
N-025	9/28/95	16:25	1.75
N-086	10/6/95	16:26	1.75
N-116 Ave.	10/6/95	16:32	1.75
N-117	10/6/95	16:38	1.75
N-009	9/27/95	16:45	1.75
N-026	9/28/95	16:59	1.75
N-036	10/4/95	16:59	1.75
N-035	10/4/95	17:03	1.78
N-064/065 Ave.	10/5/95	17:07	1.78
N-090	10/6/95	17:16	1.78
N-088/089 Ave.	10/6/95	17:24	1.78
N-118	10/6/95	17:24	1.78
N-027/028 Ave.	9/28/95	17:25	1.78
N-010	9/27/95	17:26	1.78
N-091	10/6/95	17:37	1.78
N-119	10/6/95	17:42	1.78
N-037	10/4/95	17:57	1.78
N-067	10/5/95	18:07	1.61
N-011	9/27/95	18:10	1.61
N-092	10/6/95	18:10	1.61
N-012	9/27/95	18:16	1.61
N-093/094 Ave.	10/6/95	18:21	1.61
N-038 Ave.	10/4/95	18:57	1.61

TABLE 21B. DATA SPECIFIC NORMALIZATION FACTORS - WINTER TEST.

Field Sample I.D.	Sample Date	Time Collected	Normalization Factor
N-319	12/13/95	7:39	1.26
N-218	12/13/95	7:39	1.26
N-125	12/13/95	7:41	1.26
N-110/111 Ave.	12/12/95	7:46	1.26
N-310	12/12/95	7:51	1.26
N-209	12/12/95	7:52	1.26
N-330	12/14/95	8:13	1.00
N-142	12/14/95	8:18	1.00
N-219	12/13/95	8:19	1.00
N-230	12/14/95	8:19	1.00
N-126	12/13/95	8:21	1.00
N-112/113 Ave.	12/12/95	8:26	1.00
N-320	12/13/95	8:30	1.00
N-210	12/12/95	8:31	1.00
N-311	12/12/95	8:36	1.00
N-231	12/14/95	8:56	1.00
N-127	12/13/95	8:59	1.00
N-331	12/14/95	8:59	1.00
N-220	12/13/95	9:00	0.74
N-143	12/14/95	9:00	0.74
N-114/115 Ave.	12/12/95	9:07	0.74
N-321	12/13/95	9:15	0.74
N-312	12/12/95	9:17	0.74
N-211	12/12/95	9:21	0.74
N-332	12/14/95	9:44	0.74
N-232	12/14/95	9:44	0.74
N-144	12/14/95	9:45	0.74
N-145	12/14/95	10:28	0.67
N-233	12/14/95	10:34	0.67
N-333	12/14/95	10:36	0.67
N-323	12/13/95	10:41	0.67
N-129	12/13/95	10:42	0.67
N-222	12/13/95	10:43	0.67
N-101	12/11/95	10:52	0.67
N-301	12/11/95	10:57	0.67
N-200	12/11/95	10:59	0.67
N-314	12/12/95	11:04	0.60
N-118/119 Ave.	12/12/95	11:04	0.60
N-213	12/12/95	11:14	0.60
N-223	12/13/95	11:17	0.60
N-130	12/13/95	11:19	0.60
N-102	12/11/95	11:30	0.60
N-324	12/13/95	11:31	0.60
N-201	12/11/95	11:37	0.60
N-302	12/11/95	11:39	0.60

TABLE 21B. CONTINUED.

Field Sample I.D.	Sample Date	Time Collected	Normalization Factor
N-120/121 Ave.	12/12/95	11:44	0.60
N-214	12/12/95	11:50	0.60
N-315	12/12/95	11:53	0.60
N-224	12/13/95	12:00	0.60
N-131	12/13/95	12:07	0.60
N-103	12/11/95	12:07	0.60
N-325	12/13/95	12:20	0.60
N-303	12/11/95	12:20	0.60
N-202	12/11/95	12:20	0.60
N-215	12/12/95	12:36	0.60
N-316	12/12/95	12:41	0.60
N-334	12/14/95	12:58	0.60
N-122	12/12/95	13:04	0.60
N-234	12/14/95	13:04	0.60
N-104	12/11/95	13:08	0.60
N-304	12/11/95	13:13	0.60
N-203	12/11/95	13:14	0.60
N-146	12/14/95	13:22	0.60
N-335	12/14/95	13:42	0.60
N-105	12/11/95	13:47	0.60
N-204	12/11/95	13:50	0.60
N-305	12/11/95	13:56	0.60
N-235	12/14/95	13:56	0.60
N-216	12/12/95	14:26	1.16
N-336	12/14/95	14:26	1.16
N-106	12/11/95	14:27	1.16
N-205	12/11/95	14:32	1.16
N-236	12/14/95	14:34	1.16
N-306	12/11/95	14:41	1.16
N-237	12/14/95	15:27	1.72
N-107	12/11/95	15:32	1.72
N-307	12/11/95	15:39	1.72
N-206	12/11/95	15:42	1.72
N-134	12/13/95	15:45	1.72
N-227	12/13/95	15:52	1.72
N-328	12/13/95	15:53	1.72
N-238	12/14/95	16:04	1.75
N-108	12/11/95	16:09	1.75
N-308	12/11/95	16:16	1.75
N-207	12/11/95	16:18	1.75
N-135	12/13/95	16:23	1.75
N-228	12/13/95	16:29	1.75
N-329	12/13/95	16:32	1.75
N-208	12/11/95	17:04	1.78

TABLE 22A. CALCULATION OF EMISSION RATE DATA PER LOCATION - SUMMER TEST

Dairy	Location	Area	No. of Cows	Surface Area (m2)	Flux (ug/ (m2*min))	Emissions/ Unit (lbs/yr)*
Large #1	Dry Cow Corral	Dry, Random	145	7,897	37	338
Large #1	Dry Cow Corral	Feeder	145	564	1160	757
Large #1	Dry Cow Corral	Fresh	145	4	770	3.57
Large #1	Dry Cow Corral	Shade	145	803	27	25
Large #1	Dry Cow Corral	Thick, Dist.	145	56	2	0.12
Large #1	Dry Cow Corral	Thick, Und	145	56	120	7.78
Large #1	Dry Cow Corral	Water Trough	145	19	264	5.81
Large #1	Milk Cow Corral	Dry, Random	165	7,620	85	748
Large #1	Milk Cow Corral	Feeder	165	334	234	90
Large #1	Milk Cow Corral	Fresh	165	5	68	0.40
Large #1	Milk Cow Corral	Shade	165	334	821	318
Large #1	Milk Cow Corral	Thick, Dist.	165	232	296	79
Large #1	Milk Cow Corral	Thick, Und	165	232	6032	1620
Large #1	Milk Cow Corral	Water Trough	165	208	1680	405
Large #1	Pond	Liquid	1542	4,450	76	392
Large #1	Rinsate	Liquid	1542	42	30	1.43
Large #2	Dry Cow Corral	Dry, Random	69	6,156	83	593
Large #2	Dry Cow Corral	Feeder	69	259	676	203
Large #2	Dry Cow Corral	Thick, Dist.	69	93	2	0.17
Large #2	Dry Cow Corral	Thick, Und.	69	93	298	32
Large #2	Dry Cow Corral	Water Trough	69	28	87	2.83
Large #2	Dry Cow Corral	Shade	69	375	473	205
Large #2	Milk Cow Corral	Dry, Random	80	5,839	74	503
Large #2	Milk Cow Corral	Feeder	80	259	1702	510
Large #2	Milk Cow Corral	Shade	80	375	270	117
Large #2	Milk Cow Corral	Thick, Dist.	80	697	4	3.36
Large #2	Milk Cow Corral	Thick, Und.	80	697	200	161
Large #2	Milk Cow Corral	Water Trough	80	28	369	12
Large #2	Pond	Liquid	1,900	15,000	9	160
Large #2	Stockpile	Disturbed	1,900	4,400	75	380
Large #2	Stockpile	Undisturbed	1,900	4,400	1880	9577

TABLE 22A. CONTINUED.

Dairy	Location	Area	No. of Cows	Surface Area (m2)	Flux (ug/ (m2*min))	Emissions/ Unit (lbs/yr)*
Small #1	Dry Cow Corral	Dry, Random	45	4,659	71	385
Small #1	Dry Cow Corral	Feeder	45	63	78	5.69
Small #1	Dry Cow Corral	Shade	45	256	229	68
Small #1	Dry Cow Corral	Water Trough	45	19	1100	24
Small #1	Milk Cow Corral	Dry, Random	32	6,298	63	459
Small #1	Milk Cow Corral	Feeder	32	230	162	43
Small #1	Milk Cow Corral	Shade	32	372	19	8.01
Small #1	Milk Cow Corral	Thick, Dist.	32	140	8	1.30
Small #1	Milk Cow Corral	Thick, Und.	32	140	894	146
Small #1	Milk Cow Corral	Water Trough	32	19	7798	172
Small #1	Pasture	Grass	360	80,900	16	1775
Small #1	Pond	Liquid	360	4,270	48	1698
Small #1	Stockpile	Disturbed	360	5,340	26	163
Small #1	Stockpile	Undisturbed	360	5,340	348	2148
Small #2	Dry Cow Corral	Dry, Random	57	3,518	61	248
Small #2	Dry Cow Corral	Feeder	57	170	268	53
Small #2	Dry Cow Corral	Shade	57	186	210	45
Small #2	Dry Cow Corral	Thick, Dist.	57	46	1	0.05
Small #2	Dry Cow Corral	Thick, Und.	57	46	126	6.71
Small #2	Dry Cow Corral	Water Trough	57	19	504	11
Small #2	Milk Cow Corral	Dry, Random	165	11,166	160	2064
Small #2	Milk Cow Corral	Feeder	165	37	1479	63
Small #2	Milk Cow Corral	Shade	165	1,003	310	360
Small #2	Milk Cow Corral	Thick, Dist.	165	102	197	23
Small #2	Milk Cow Corral	Thick, Und.	165	102	10836	1280
Small #2	Milk Cow Corral	Water Trough	165	37	206	8.84
Small #2	Pond	Liquid	990	2,120	140	344
Small #2	Stockpile	Disturbed	990	56	0	0.03
Small #2	Stockpile	Undisturbed	990	56	11	0.74

* - Emissions from manure have been normalized based on the diurnal results obtained from the 24-hour study. The 24-hour normalization factors were not applied to pond, rinsate, or disturbed samples.

- Reported emissions for disturbed samples (both in-corral and stockpile) have been multiplied by a factor of 4/365 to account for the approximately four days of the year that these emissions would be applicable.
- Average results were reported when multiple samples were taken at any type of area.
- Average results were reported for laboratory and field duplicate samples.
- Non-detected results were included by using 1/2 of the detection limit.

TABLE 22B. CALCULATION OF EMISSION RATE DATA PER LOCATION - WINTER TEST.

Dairy	Location	Area	No. of Cows	Surface Area (m2)	Flux (ug/ (m2*min))	Emissions/ Unit (lbs/yr)*
Large #1	Dry Cow Corral	Dry, Random	170	7880	34	310
Large #1	Dry Cow Corral	Feeder	170	564	483	315
Large #1	Dry Cow Corral	Fresh	170	5	4080	24
Large #1	Dry Cow Corral	Shade	170	803	84	78
Large #1	Dry Cow Corral	Thick, Dist.	170	56	11	1
Large #1	Dry Cow Corral	Thick, Und.	170	56	216	14
Large #1	Dry Cow Corral	Water Trough	170	38	348	15
Large #1	Milk Cow Corral	Dry, Random	191	8330	112	1079
Large #1	Milk Cow Corral	Feeder	191	426	1247	615
Large #1	Milk Cow Corral	Fresh	191	6	65	0
Large #1	Milk Cow Corral	Shade	191	334	170	66
Large #1	Milk Cow Corral	Thick, Dist.	191	93	18	2
Large #1	Milk Cow Corral	Thick, Und.	191	93	189	20
Large #1	Milk Cow Corral	Water Trough	191	208	688	166
Large #1	Pond	Liquid	1540	4450	65	335
Large #2	Dry Cow Corral	Dry, Random	49	6160	54	385
Large #2	Dry Cow Corral	Feeder	49	259	239	72
Large #2	Dry Cow Corral	Shade	49	375	330	143
Large #2	Dry Cow Corral	Thick, Dist.	49	93	1	0
Large #2	Dry Cow Corral	Thick, Und.	49	93	52	6
Large #2	Dry Cow Corral	Water Trough	49	28	300	10
Large #2	Milk Cow Corral	Dry, Random	108	5840	53	357
Large #2	Milk Cow Corral	Feeder	108	259	127	38
Large #2	Milk Cow Corral	Shade	108	375	282	122
Large #2	Milk Cow Corral	Thick, Dist.	108	697	13	11
Large #2	Milk Cow Corral	Thick, Und.	108	697	188	151
Large #2	Milk Cow Corral	Water Trough	108	28	162	5
Large #2	Stockpile	Disturbed	1900	4400	10	50
Large #2	Stockpile	Undisturbed	1900	4400	378	1928
Large #2	Pond	Liquid	1900	15000	9	160

TABLE 22B. CONTINUED.

Dairy	Location	Area	No. of Cows	Surface Area (m2)	Flux (ug/(m2*min))	Emissions/ Unit (lbs/yr)*
Small #2	Dry Cow Corral	Dry, Random	49	3540	52	215
Small #2	Dry Cow Corral	Feeder	49	170	1200	236
Small #2	Dry Cow Corral	Fresh	49	2	150	0
Small #2	Dry Cow Corral	Shade	49	186	615	132
Small #2	Dry Cow Corral	Thick, Dist.	49	28	24	1
Small #2	Dry Cow Corral	Thick, Und.	49	28	504	16
Small #2	Dry Cow Corral	Water Trough	49	19	708	16
Small #2	Milk Cow Corral	Dry, Random	201	11200	93	1200
Small #2	Milk Cow Corral	Feeder	201	460	315	168
Small #2	Milk Cow Corral	Fresh	201	6	102	1
Small #2	Milk Cow Corral	Shade	201	1000	186	215
Small #2	Milk Cow Corral	Thick, Dist.	201	74	5	0
Small #2	Milk Cow Corral	Thick, Und.	201	74	255	22
Small #2	Milk Cow Corral	Water Trough	201	37	258	11
Small #2	Pond	Liquid	1010	2120	171	419
Small #2	Stockpile	Disturbed	1010	110	37	5
Small #2	Stockpile	Undisturbed	1010	110	48	92
Small #3	Dry Cow Corral	Dry, Random	140	3250	274	1031
Small #3	Dry Cow Corral	Feeder	140	140	280	45
Small #3	Dry Cow Corral	Shade	140	160	414	77
Small #3	Dry Cow Corral	Thick, Dist.	140	56	7	0
Small #3	Dry Cow Corral	Thick, Und.	140	56	220	14
Small #3	Dry Cow Corral	Water Trough	140	37	355	15
Small #3	Irrigated Pasture	Grass	790	72900	18	1555
Small #3	Milk Cow Corral	Dry, Random	200	8460	177	1734
Small #3	Milk Cow Corral	Feeder	200	350	476	193
Small #3	Milk Cow Corral	Shade	200	390	418	189
Small #3	Milk Cow Corral	Thick, Dist.	200	19	5	0
Small #3	Milk Cow Corral	Thick, Und.	200	19	413	9
Small #3	Milk Cow Corral	Water Trough	200	149	456	79
Small #3	Stockpile	Undisturbed	790	8090	101	941

TABLE 23A. EMISSION RATE DATA PER DAIRY AND INTERIM PER COW EMISSION FACTORS - SUMMER TEST.

Dairy	Location	Area	Emissions/ Unit (lbs/yr)*	Emissions/ Unit/Cow (lbs/yr)**	Emissions/ Individual Component (lbs/yr)	Emissions/ Component/ Cow (lbs/yr)
Large #1	Dry Cow Corral	Dry, Random	338	2.33		
Large #1	Dry Cow Corral	Feeder	757	5.22		
Large #1	Dry Cow Corral	Fresh	3.57	0.025		
Large #1	Dry Cow Corral	Shade	25	0.17		
Large #1	Dry Cow Corral	Thick, Dist.	0.12	0.00083		
Large #1	Dry Cow Corral	Thick, Und	7.78	0.054		
Large #1	Dry Cow Corral	Water Trough	5.81	0.040	1138	7.85
Large #1	Milk Cow Corral	Dry, Random	748	4.54		
Large #1	Milk Cow Corral	Feeder	90	0.55		
Large #1	Milk Cow Corral	Fresh	0.40	0.0024		
Large #1	Milk Cow Corral	Shade	318	1.92		
Large #1	Milk Cow Corral	Thick, Dist.	79	0.48		
Large #1	Milk Cow Corral	Thick, Und	1620	9.82		
Large #1	Milk Cow Corral	Water Trough	405	2.45	3261	19.76
Large #1	Pond	Liquid	392	0.25	392	0.25
Large #1	Rinsate	Liquid	1.43	0.00093	1.43	0.00093

TABLE 23A. CONTINUED.

Dairy	Location	Area	Emissions/ Unit (lbs/yr)*	Emissions/ Unit/Cow (lbs/yr)**	Emissions/ Individual Component (lbs/yr)	Emissions/ Component/ Cow (lbs/yr)
Large #2	Dry Cow Corral	Dry, Random	593	8.60		
Large #2	Dry Cow Corral	Feeder	203	2.94		
Large #2	Dry Cow Corral	Thick, Dist.	0.17	0.0024		
Large #2	Dry Cow Corral	Thick, Und.	32	0.46		
Large #2	Dry Cow Corral	Water Trough	2.83	0.041		
Large #2	Dry Cow Corral	Shade	205	2.97	1036	15.02
Large #2	Milk Cow Corral	Dry, Random	503	6.28		
Large #2	Milk Cow Corral	Feeder	510	6.38		
Large #2	Milk Cow Corral	Shade	117	1.47		
Large #2	Milk Cow Corral	Thick, Dist.	3.36	0.042		
Large #2	Milk Cow Corral	Thick, Und.	161	2.02		
Large #2	Milk Cow Corral	Water Trough	12	0.15	1307	16.34
Large #2	Pond	Liquid	160	0.084	160	0.084
Large #2	Stockpile	Disturbed	380	0.20		
Large #2	Stockpile	Undisturbed	9577	5.04	9956	5.24

TABLE 23A. CONTINUED.

Dairy	Location	Area	Emissions/ Unit (lbs/yr)*	Emissions/ Unit/Cow (lbs/yr)**	Emissions/ Individual Component (lbs/yr)	Emissions/ Component/ Cow (lbs/yr)
Small #1	Dry Cow Corral	Dry, Random	385	8.56		
Small #1	Dry Cow Corral	Feeder	5.69	0.13		
Small #1	Dry Cow Corral	Shade	68	1.51		
Small #1	Dry Cow Corral	Water Trough	24	0.54	483	10.73
Small #1	Milk Cow Corral	Dry, Random	459	14		
Small #1	Milk Cow Corral	Feeder	43	1.35		
Small #1	Milk Cow Corral	Shade	8.01	0.25		
Small #1	Milk Cow Corral	Thick, Dist.	1.30	0.041		
Small #1	Milk Cow Corral	Thick, Und.	146	4.57		
Small #1	Milk Cow Corral	Water Trough	172	5.36	829	26
Small #1	Pasture	Grass	1775	4.93	1775	4.93
Small #1	Pond	Liquid	1698	4.72	1698	4.72
Small #1	Stockpile	Disturbed	163	0.45		
Small #1	Stockpile	Undisturbed	2148	5.97	2311	6.42

TABLE 23A. CONTINUED.

Dairy	Location	Area	Emissions/ Unit (lbs/yr)*	Emissions/ Unit/Cow (lbs/yr)**	Emissions/ Individual Component (lbs/yr)	Emissions/ Component/ Cow (lbs/yr)
Small #2	Dry Cow Corral	Dry, Random	248	4.35		
Small #2	Dry Cow Corral	Feeder	53	0.93		
Small #2	Dry Cow Corral	Shade	45	0.79		
Small #2	Dry Cow Corral	Thick, Dist.	0.05	0.00088		
Small #2	Dry Cow Corral	Thick, Und.	6.71	0.12		
Small #2	Dry Cow Corral	Water Trough	11	0.19	363	6.38
Small #2	Milk Cow Corral	Dry, Random	2064	12.51		
Small #2	Milk Cow Corral	Feeder	63	0.38		
Small #2	Milk Cow Corral	Shade	360	2.18		
Small #2	Milk Cow Corral	Thick, Dist.	23	0.14		
Small #2	Milk Cow Corral	Thick, Und.	1280	7.76		
Small #2	Milk Cow Corral	Water Trough	8.84	0.054	3799	23.02
Small #2	Pond	Liquid	344	0.35	344	0.35
Small #2	Stockpile	Disturbed	0.03	0.000028		
Small #2	Stockpile	Undisturbed	0.74	0.00075	0.77	0.00077

TABLE 23A. CONTINUED.

*	- Emissions from manure have been normalized based on the diurnal results
	obtained from the 24-hour study. The 24-hour normalization factors were
	not applied to pond, rinsate, or disturbed samples.
	- Reported emissions for disturbed samples (both in-corral and stockpile)
	have been multiplied by a factor of 4/365 to account for the approximately
	four days of the year that these emissions would be applicable.
	- Average results were reported when multiple samples were taken at
	any type of area.
	- Average results were reported for laboratory and field duplicate samples.
	- Non-detected results were included by using 1/2 of the detection limit.
**	- Dry and milk cow corral emissions were calculated using the number of cows
	in that particular corral.
	- Emissions for pond, rinsate, pasture, and stockpile samples were calculated
	using the total number of cows for the entire dairy.

TABLE 23B. EMISSION RATE DATA PER DAIRY AND INTERIM PER COW EMISSION FACTORS - WINTER TEST.

Dairy	Location	Area	No. of Cows	Emissions/ Unit (lbs/yr)*	Emissions/ Unit/Cow (lbs/yr)**	Emissions/ Individual Component (lbs/yr)	Emissions/ Component/ Cow (lbs/yr)
Large #1	Dry Cow Corral	Dry, Random	170	310	1.82		
Large #1	Dry Cow Corral	Feeder	170	315	1.86		
Large #1	Dry Cow Corral	Fresh	170	24	0.14		
Large #1	Dry Cow Corral	Shade	170	78	0.46		
Large #1	Dry Cow Corral	Thick, Dist.	170	1	0.00		
Large #1	Dry Cow Corral	Thick, Und.	170	14	0.08		
Large #1	Dry Cow Corral	Water Trough	170	15	0.09	757	4.45
Large #1	Milk Cow Corral	Dry, Random	191	1079	6.35		
Large #1	Milk Cow Corral	Feeder	191	615	3.62		
Large #1	Milk Cow Corral	Fresh	191	0	0.00		
Large #1	Milk Cow Corral	Shade	191	66	0.39		
Large #1	Milk Cow Corral	Thick, Dist.	191	2	0.01		
Large #1	Milk Cow Corral	Thick, Und.	191	20	0.12		
Large #1	Milk Cow Corral	Water Trough	191	166	0.97	1949	10.20
Large #1	Pond	Liquid	1540	335	1.97	335	0.22

TABLE 23B. CONTINUED.

Dairy	Location	Area	No. of Cows	Emissions/ Unit (lbs/yr)*	Emissions/ Unit/Cow (lbs/yr)**	Emissions/ Individual Component (lbs/yr)	Emissions/ Component/ Cow (lbs/yr)
Large #2	Dry Cow Corral	Dry, Random	49	385	2.26		
Large #2	Dry Cow Corral	Feeder	49	72	0.42		
Large #2	Dry Cow Corral	Shade	49	143	0.84		
Large #2	Dry Cow Corral	Thick, Dist.	49	0	0.00		
Large #2	Dry Cow Corral	Thick, Und.	49	6	0.03		
Large #2	Dry Cow Corral	Water Trough	49	10	0.06	616	12.56
Large #2	Milk Cow Corral	Dry, Random	108	357	2.10		
Large #2	Milk Cow Corral	Feeder	108	38	0.22		
Large #2	Milk Cow Corral	Shade	108	122	0.72		
Large #2	Milk Cow Corral	Thick, Dist.	108	11	0.06		
Large #2	Milk Cow Corral	Thick, Und.	108	151	0.89		
Large #2	Milk Cow Corral	Water Trough	108	5	0.03	685	6.34
Large #2	Pond	Liquid	1,900	160	0.084	160	0.084
Large #2	Stockpile	Disturbed	1900	50	0.29		
Large #2	Stockpile	Undisturbed	1900	1928	11.34	1978	1.04

TABLE 23B. CONTINUED.

Dairy	Location	Area	No. of Cows	Emissions/ Unit (lbs/yr)*	Emissions/ Unit/Cow (lbs/yr)**	Emissions/ Individual Component (lbs/yr)	Emissions/ Component/ Cow (lbs/yr)
Small #2	Dry Cow Corral	Dry, Random	49	215	1.27		
Small #2	Dry Cow Corral	Feeder	49	236	1.39		
Small #2	Dry Cow Corral	Fresh	49	0	0.00		
Small #2	Dry Cow Corral	Shade	49	132	0.78		
Small #2	Dry Cow Corral	Thick, Dist.	49	1	0.00		
Small #2	Dry Cow Corral	Thick, Und.	49	16	0.10		
Small #2	Dry Cow Corral	Water Trough	49	16	0.09	617	12.58
Small #2	Milk Cow Corral	Dry, Random	201	1200	7.06		
Small #2	Milk Cow Corral	Feeder	201	168	0.99		
Small #2	Milk Cow Corral	Fresh	201	1	0.00		
Small #2	Milk Cow Corral	Shade	201	215	1.27		
Small #2	Milk Cow Corral	Thick, Dist.	201	0	0.00		
Small #2	Milk Cow Corral	Thick, Und.	201	22	0.13		
Small #2	Milk Cow Corral	Water Trough	201	11	0.07	1617	8.04
Small #2	Pond	Liquid	1010	419	2.47	419	0.42
Small #2	Stockpile	Disturbed	1010	5	0.03		
Small #2	Stockpile	Undisturbed	1010	92	0.54	96	0.10

TABLE 23B. CONTINUED.

Dairy	Location	Area	No. of Cows	Emissions/ Unit (lbs/yr)*	Emissions/ Unit/Cow (lbs/yr)**	Emissions/ Individual Component (lbs/yr)	Emissions/ Component/ Cow (lbs/yr)
Small #3	Dry Cow Corral	Dry, Random	140	1031	6.07		
Small #3	Dry Cow Corral	Feeder	140	45	0.27		
Small #3	Dry Cow Corral	Shade	140	77	0.45		
Small #3	Dry Cow Corral	Thick, Dist.	140	0	0.00		
Small #3	Dry Cow Corral	Thick, Und.	140	14	0.08		
Small #3	Dry Cow Corral	Water Trough	140	15	0.09	1183	8.45
Small #3	Irrigated Pasture	Grass	790	1555	9.15	1555	1.97
Small #3	Milk Cow Corral	Dry, Random	200	1734	10.20		
Small #3	Milk Cow Corral	Feeder	200	193	1.13		
Small #3	Milk Cow Corral	Shade	200	189	1.11		
Small #3	Milk Cow Corral	Thick, Dist.	200	0	0.00		
Small #3	Milk Cow Corral	Thick, Und.	200	9	0.05		
Small #3	Milk Cow Corral	Water Trough	200	79	0.46	2203	11.01
Small #3	Stockpile	Undisturbed	790	941	5.54	941	1.19

TABLE 23B. CONTINUED.

*	- Emissions from manure have been normalized based on the diurnal results
	obtained from the 24-hour study. The 24-hour normalization factors were
	not applied to pond, rinsate, or disturbed samples.
	- Reported emissions for disturbed samples (both in-corral and stockpile)
	have been multiplied by a factor of 4/365 to account for the approximately
	four days of the year that these emissions would be applicable.
	- Average results were reported when multiple samples were taken at
	any type of area.
	- Average results were reported for laboratory and field duplicate samples.
	- Non-detected results were included by using 1/2 of the detection limit.
* *	- Dry and milk cow corral emissions were calculated using the number of cows
	in that particular corral.
	- Emissions for pond, rinsate, pasture, and stockpile samples were calculated
	using the total number of cows for the entire dairy.

TABLE 24A. LISTING OF INTERIM (PER COW) EMISSION FACTORS PER DAIRY - SUMMER TEST.

Location	Area	Dairy	Emissions/ Unit/Cow (lbs/yr)*	Average Emissions/ Unit/Cow (lbs/yr)	Average Emissions/ Unit/Cow (lbs/yr) - excluding Small Dairy #1
Dry Cow Corral	Dry, Random	Large #1	2.33		
Dry Cow Corral	Dry, Random	Large #2	8.60		
Dry Cow Corral	Dry, Random	Small #1	8.56		
Dry Cow Corral	Dry, Random	Small #2	4.35	5.96	5.09
Dry Cow Corral	Feeder	Large #1	5.22		
Dry Cow Corral	Feeder	Large #2	2.94		
Dry Cow Corral	Feeder	Small #1	0.13		
Dry Cow Corral	Feeder	Small #2	0.93	2.30	3.03
Dry Cow Corral	Fresh	Large #1	0.025	0.025	0.025
Dry Cow Corral	Shade	Large #1	0.17		
Dry Cow Corral	Shade	Large #2	2.97		
Dry Cow Corral	Shade	Small #1	1.51		
Dry Cow Corral	Shade	Small #2	0.79	1.36	1.31
Dry Cow Corral	Thick, Dist.	Large #1	0.00083		
Dry Cow Corral	Thick, Dist.	Large #2	0.0024		
Dry Cow Corral	Thick, Dist.	Small #2	0.00088	0.0014	0.0014
Dry Cow Corral	Thick, Und	Large #1	0.054		
Dry Cow Corral	Thick, Und.	Large #2	0.46		
Dry Cow Corral	Thick, Und.	Small #2	0.12	0.21	0.21
Dry Cow Corral	Water Trough	Large #1	0.040		
Dry Cow Corral	Water Trough	Large #2	0.041		
Dry Cow Corral	Water Trough	Small #1	0.54		
Dry Cow Corral	Water Trough	Small #2	0.19	0.20	0.092
Milk Cow Corral	Dry, Random	Large #1	4.54		
Milk Cow Corral	Dry, Random	Large #2	6.28		
Milk Cow Corral	Dry, Random	Small #1	14		
Milk Cow Corral	Dry, Random	Small #2	12.51	9.41	7.78
Milk Cow Corral	Feeder	Large #1	0.55		
Milk Cow Corral	Feeder	Large #2	6.38		
Milk Cow Corral	Feeder	Small #1	1.35		
Milk Cow Corral	Feeder	Small #2	0.38	2.17	2.44
Milk Cow Corral	Fresh	Large #1	0.0024	0.0024	0.0024
Milk Cow Corral	Shade	Large #1	1.92		
Milk Cow Corral	Shade	Large #2	1.47		
Milk Cow Corral	Shade	Small #1	0.25		
Milk Cow Corral	Shade	Small #2	2.18	1.45	1.86

TABLE 24A. CONTINUED.

Location	Area	Dairy	Emissions/ Unit/Cow (lbs/yr)*	Average Emissions/ Unit/Cow (lbs/yr)	Average Emissions/ Unit/Cow (lbs/yr) - excluding Small Dairy #1
Milk Cow Corral	Thick, Dist.	Large #1	0.48		
Milk Cow Corral	Thick, Dist.	Large #2	0.042		
Milk Cow Corral	Thick, Dist.	Small #1	0.041		
Milk Cow Corral	Thick, Dist.	Small #2	0.14	0.18	0.22
Milk Cow Corral	Thick, Und	Large #1	9.82		
Milk Cow Corral	Thick, Und.	Large #2	2.02		
Milk Cow Corral	Thick, Und.	Small #1	4.57		
Milk Cow Corral	Thick, Und.	Small #2	7.76	6.04	6.53
Milk Cow Corral	Water Trough	Large #1	2.45		
Milk Cow Corral	Water Trough	Large #2	0.15		
Milk Cow Corral	Water Trough	Small #1	5.36		
Milk Cow Corral	Water Trough	Small #2	0.054	2.00	0.88
Pasture	Grass	Small #1	4.93	4.93	4.93
Pond	Liquid	Large #1	0.25		
Pond	Liquid	Large #2	0.084		
Pond	Liquid	Small #1	4.72		
Pond	Liquid	Small #2	0.35	1.35	0.23
Rinsate	Liquid	Large #1	0.00093	0.00093	0.00093
Stockpile	Disturbed	Large #2	0.20		
Stockpile	Disturbed	Small #1	0.45		
Stockpile	Disturbed	Small #2	0.000028	0.22	0.100
Stockpile	Undisturbed	Large #2	5.04		
Stockpile	Undisturbed	Small #1	5.97		
Stockpile	Undisturbed	Small #2	0.00075	3.67	2.521

* - Emissions from manure have been normalized based on the diurnal results obtained from the 24-hour study. The 24-hour normalization factors were not applied to pond, rinsate, or disturbed samples.

- Reported emissions for disturbed samples (both in-corral and stockpile) have been multiplied by a factor of 4/365 to account for the approximately four days of the year that these emissions would be applicable.
- Average results were reported when multiple samples were taken at any type of area.
- Average results were reported for laboratory and field duplicate samples.
- Non-detected results were included by using 1/2 of the detection limit.
- Dry and milk cow corral emissions were calculated using the number of cows in that particular corral.
- Emissions for pond, rinsate, pasture, and stockpile samples were calculated using the total number of cows for the entire dairy.

TABLE 24B. LISTING OF INTERIM (PER COW) EMISSION FACTORS PER DAIRY - WINTER TEST.

Location	Area	Dairy	Emissions/ Unit/Cow (lbs/yr)*	Average Emissions/ Unit/Cow (lbs/yr)
Dry Cow Corral	Dry, Random	Large #1	1.8	
Dry Cow Corral	Dry, Random	Large #2	2.3	
Dry Cow Corral	Dry, Random	Small #2	1.3	
Dry Cow Corral	Dry, Random	Small #3	6.1	2.9
Dry Cow Corral	Feeder	Large #1	1.9	
Dry Cow Corral	Feeder	Large #2	0.42	
Dry Cow Corral	Feeder	Small #2	1.4	
Dry Cow Corral	Feeder	Small #3	0.27	0.98
Dry Cow Corral	Fresh	Large #1	0.14	
Dry Cow Corral	Fresh	Small #2	0.0020	0.070
Dry Cow Corral	Shade	Large #1	0.46	
Dry Cow Corral	Shade	Large #2	0.84	
Dry Cow Corral	Shade	Small #2	0.78	
Dry Cow Corral	Shade	Small #3	0.45	0.63
Dry Cow Corral	Thick, Dist.	Large #1	0.0042	
Dry Cow Corral	Thick, Dist.	Large #2	0.00083	
Dry Cow Corral	Thick, Dist.	Small #2	0.0046	
Dry Cow Corral	Thick, Dist.	Small #3	0.0028	0.0031
Dry Cow Corral	Thick, Und.	Large #1	0.082	
Dry Cow Corral	Thick, Und.	Large #2	0.033	
Dry Cow Corral	Thick, Und.	Small #2	0.096	
Dry Cow Corral	Thick, Und.	Small #3	0.084	0.074
Dry Cow Corral	Water Trough	Large #1	0.090	
Dry Cow Corral	Water Trough	Large #2	0.057	
Dry Cow Corral	Water Trough	Small #2	0.092	
Dry Cow Corral	Water Trough	Small #3	0.090	0.082
Irrigated Pasture	Grass	Small #3	9.1	9.1
Milk Cow Corral	Dry, Random	Large #1	6.3	
Milk Cow Corral	Dry, Random	Large #2	2.1	
Milk Cow Corral	Dry, Random	Small #2	7.1	
Milk Cow Corral	Dry, Random	Small #3	10.2	6.4
Milk Cow Corral	Feeder	Large #1	3.6	
Milk Cow Corral	Feeder	Large #2	0.22	
Milk Cow Corral	Feeder	Small #2	0.99	
Milk Cow Corral	Feeder	Small #3	1.1	1.5
Milk Cow Corral	Fresh	Large #1	0.0027	
Milk Cow Corral	Fresh	Small #2	0.0042	0.0034
Milk Cow Corral	Shade	Large #1	0.39	
Milk Cow Corral	Shade	Large #2	0.72	

TABLE 24B. CONTINUED.

Location	Area	Dairy	Emissions/ Unit/Cow (lbs/yr)*	Average Emissions/ Unit/Cow (lbs/yr)
Milk Cow Corral	Shade	Small #2	1.3	
Milk Cow Corral	Shade	Small #3	1.1	0.87
Milk Cow Corral	Thick, Dist.	Large #1	0.011	
Milk Cow Corral	Thick, Dist.	Large #2	0.062	
Milk Cow Corral	Thick, Dist.	Small #2	0.0025	
Milk Cow Corral	Thick, Dist.	Small #3	0.00071	0.019
Milk Cow Corral	Thick, Und.	Large #1	0.12	
Milk Cow Corral	Thick, Und.	Large #2	0.89	
Milk Cow Corral	Thick, Und.	Small #2	0.13	
Milk Cow Corral	Thick, Und.	Small #3	0.05	0.30
Milk Cow Corral	Water Trough	Large #1	0.97	
Milk Cow Corral	Water Trough	Large #2	0.031	
Milk Cow Corral	Water Trough	Small #2	0.065	
Milk Cow Corral	Water Trough	Small #3	0.46	0.38
Pond	Liquid	Large #1	2.0	
Pond	Liquid	Large #2	0.084	
Pond	Liquid	Small #2	2.5	1.5
Stockpile	Disturbed	Large #2	0.29	
Stockpile	Disturbed	Small #2	0.028	0.16
Stockpile	Undisturbed	Large #2	11	
Stockpile	Undisturbed	Small #2	0.54	
Stockpile	Undisturbed	Small #3	5.5	5.8
*	- Emissions from manure have been normalized based on the diurnal results obtained from the 24-hour study. The 24-hour normalization factors were not applied to pond, rinsate, or disturbed samples.			
	- Reported emissions for disturbed samples (both in-corral and stockpile) have been multiplied by a factor of 4/365 to account for the approximately four days of the year that these emissions would be applicable.			
	- Average results were reported when multiple samples were taken at any type of area.			
	- Average results were reported for laboratory and field duplicate samples.			
	- Non-detected results were included by using 1/2 of the detection limit.			
	- Dry and milk cow corral emissions were calculated using the number of cows in that particular corral.			
	- Emissions for pond, rinsate, pasture, and stockpile samples were calculated using the total number of cows for the entire dairy.			

TABLE 25A. PER DAIRY EMISSION RATE DATA AND FINAL PER COW EMISSION FACTORS - SUMMER TEST.

Dairy	Location	Area	Emissions/Dairy by Component (lbs/yr)	Emissions/ Dairy (lbs/yr)*	Emissions/ Dairy/Cow (lbs/yr)
Large #1	Dry Cow Corral	Dry, Random			
Large #1	Dry Cow Corral	Feeder			
Large #1	Dry Cow Corral	Fresh	Based on		
Large #1	Dry Cow Corral	Shade	191 dry		
Large #1	Dry Cow Corral	Thick, Dist.	cows:		
Large #1	Dry Cow Corral	Thick, Und			
Large #1	Dry Cow Corral	Water Trough	1499		
Large #1	Milk Cow Corral	Dry, Random			
Large #1	Milk Cow Corral	Feeder			
Large #1	Milk Cow Corral	Fresh	Based on		
Large #1	Milk Cow Corral	Shade	1351 milk		
Large #1	Milk Cow Corral	Thick, Dist.	cows:		
Large #1	Milk Cow Corral	Thick, Und			
Large #1	Milk Cow Corral	Water Trough	26700		
Large #1	Pond	Liquid	392		
Large #1	Rinsate	Liquid	1.43	28592	18.54

TABLE 25A. CONTINUED.

Dairy	Location	Area	Emissions/Dairy by Component (lbs/yr)	Emissions/ Dairy (lbs/yr)*	Emissions/ Dairy/Cow (lbs/yr)
Small #2	Dry Cow Corral	Dry, Random			
Small #2	Dry Cow Corral	Feeder	Based on		
Small #2	Dry Cow Corral	Shade	180 dry		
Small #2	Dry Cow Corral	Thick, Dist.	cows:		
Small #2	Dry Cow Corral	Thick, Und.			
Small #2	Dry Cow Corral	Water Trough	1148		
Small #2	Milk Cow Corral	Dry, Random			
Small #2	Milk Cow Corral	Feeder	Based on		
Small #2	Milk Cow Corral	Shade	810 milk		
Small #2	Milk Cow Corral	Thick, Dist.	cows:		
Small #2	Milk Cow Corral	Thick, Und.			
Small #2	Milk Cow Corral	Water Trough	18649		
Small #2	Pond	Liquid	344		
Small #2	Stockpile	Disturbed			
Small #2	Stockpile	Undisturbed	0.77	20141	20.34

* - Emissions/dairy include pond, rinsate, pasture, and stockpile emissions.

TABLE 25A. CONTINUED.

Dairy	Location	Area	Emissions/Dairy by Component (lbs/yr)	Emissions/ Dairy (lbs/yr)*	Emissions/ Dairy/Cow (lbs/yr)
Large #2	Dry Cow Corral	Dry, Random			
Large #2	Dry Cow Corral	Feeder	Based on		
Large #2	Dry Cow Corral	Thick, Dist.	400 dry		
Large #2	Dry Cow Corral	Thick, Und.	cows:		
Large #2	Dry Cow Corral	Water Trough			
Large #2	Dry Cow Corral	Shade	6008		
Large #2	Milk Cow Corral	Dry, Random			
Large #2	Milk Cow Corral	Feeder	Based on		
Large #2	Milk Cow Corral	Shade	1500 milk		
Large #2	Milk Cow Corral	Thick, Dist.	cows:		
Large #2	Milk Cow Corral	Thick, Und.			
Large #2	Milk Cow Corral	Water Trough	24503		
Large #2	Pond	Liquid	160		
Large #2	Stockpile	Disturbed			
Large #2	Stockpile	Undisturbed	9956	40627	21.38

TABLE 25A. CONTINUED.

Dairy	Location	Area	Emissions/Dairy by Component (lbs/yr)	Emissions/ Dairy (lbs/yr)*	Emissions/ Dairy/Cow (lbs/yr)
Small #1	Dry Cow Corral	Dry, Random	Based on		
Small #1	Dry Cow Corral	Feeder	60 dry		
Small #1	Dry Cow Corral	Shade	cows:		
Small #1	Dry Cow Corral	Water Trough	644		
Small #1	Milk Cow Corral	Dry, Random			
Small #1	Milk Cow Corral	Feeder	Based on		
Small #1	Milk Cow Corral	Shade	300 milk		
Small #1	Milk Cow Corral	Thick, Dist.	cows:		
Small #1	Milk Cow Corral	Thick, Und.			
Small #1	Milk Cow Corral	Water Trough	7771		
Small #1	Pasture	Grass	1775		
Small #1	Pond	Liquid	1698		
Small #1	Stockpile	Disturbed			
Small #1	Stockpile	Undisturbed	2311	14199	39.44

TABLE 25B. PER DAIRY EMISSION RATE DATA AND FINAL PER COW EMISSION FACTORS - WINTER TEST.

Dairy	Location	Area	Emissions/Dairy by Component (lbs/yr)	Emissions/ Dairy (lbs/yr)*	Emissions/ Dairy/Cow (lbs/yr)
Large #1	Dry Cow Corral	Dry, Random			
Large #1	Dry Cow Corral	Feeder			
Large #1	Dry Cow Corral	Fresh	Based on		
Large #1	Dry Cow Corral	Shade	190 dry		
Large #1	Dry Cow Corral	Thick, Dist.	cows:		
Large #1	Dry Cow Corral	Thick, Und.			
Large #1	Dry Cow Corral	Water Trough	846		
Large #1	Milk Cow Corral	Dry, Random			
Large #1	Milk Cow Corral	Feeder			
Large #1	Milk Cow Corral	Fresh	Based on		
Large #1	Milk Cow Corral	Shade	1350 milk		
Large #1	Milk Cow Corral	Thick, Dist.	cows:		
Large #1	Milk Cow Corral	Thick, Und.			
Large #1	Milk Cow Corral	Water Trough	13774		
Large #1	Pond	Liquid	335	14955	9.71

TABLE 25B. CONTINUED.

Dairy	Location	Area	Emissions/Dairy by Component (lbs/yr)	Emissions/ Dairy (lbs/yr)*	Emissions/ Dairy/Cow (lbs/yr)
Large #2	Dry Cow Corral	Dry, Random			
Large #2	Dry Cow Corral	Feeder	Based on		
Large #2	Dry Cow Corral	Shade	400 dry		
Large #2	Dry Cow Corral	Thick, Dist.	cows:		
Large #2	Dry Cow Corral	Thick, Und.			
Large #2	Dry Cow Corral	Water Trough	5025		
Large #2	Milk Cow Corral	Dry, Random			
Large #2	Milk Cow Corral	Feeder	Based on		
Large #2	Milk Cow Corral	Shade	1500 milk		
Large #2	Milk Cow Corral	Thick, Dist.	cows:		
Large #2	Milk Cow Corral	Thick, Und.			
Large #2	Milk Cow Corral	Water Trough	9509		
Large #2	Pond	Liquid	160		
Large #2	Stockpile	Disturbed			
Large #2	Stockpile	Undisturbed	1978	16671	8.77

TABLE 25B. CONTINUED.

Dairy	Location	Area	Emissions/Dairy by Component (lbs/yr)	Emissions/ Dairy (lbs/yr)*	Emissions/ Dairy/Cow (lbs/yr)
Small #2	Dry Cow Corral	Dry, Random			
Small #2	Dry Cow Corral	Feeder			
Small #2	Dry Cow Corral	Fresh	Based on		
Small #2	Dry Cow Corral	Shade	180 dry		
Small #2	Dry Cow Corral	Thick, Dist.	cows:		
Small #2	Dry Cow Corral	Thick, Und.			
Small #2	Dry Cow Corral	Water Trough	2265		
Small #2	Milk Cow Corral	Dry, Random			
Small #2	Milk Cow Corral	Feeder			
Small #2	Milk Cow Corral	Fresh	Based on		
Small #2	Milk Cow Corral	Shade	830 milk		
Small #2	Milk Cow Corral	Thick, Dist.	cows:		
Small #2	Milk Cow Corral	Thick, Und.			
Small #2	Milk Cow Corral	Water Trough	6676		
Small #2	Pond	Liquid	419		
Small #2	Stockpile	Disturbed			
Small #2	Stockpile	Undisturbed	96	9457	9.36

TABLE 25B. CONTINUED.

Dairy	Location	Area	Emissions/Dairy by Component (lbs/yr)	Emissions/ Dairy (lbs/yr)*	Emissions/ Dairy/Cow (lbs/yr)
Small #3	Dry Cow Corral	Dry, Random			
Small #3	Dry Cow Corral	Feeder	Based on		
Small #3	Dry Cow Corral	Shade	120 dry		
Small #3	Dry Cow Corral	Thick, Dist.	cows:		
Small #3	Dry Cow Corral	Thick, Und.			
Small #3	Dry Cow Corral	Water Trough	1014		
Small #3	Irrigated Pasture	Grass	1555		
Small #3	Milk Cow Corral	Dry, Random			
Small #3	Milk Cow Corral	Feeder	Based on		
Small #3	Milk Cow Corral	Shade	670 milk		
Small #3	Milk Cow Corral	Thick, Dist.	cows:		
Small #3	Milk Cow Corral	Thick, Und.			
Small #3	Milk Cow Corral	Water Trough	7379		
Small #3	Stockpile	Undisturbed	941	10890	13.78
*	- Emissions/dairy include pond, rinsate, pasture, and stockpile emissions.				

ATTACHMENT A

EMISSION MEASUREMENT DATA SHEETS

ATTACHMENT B

SAMPLE CHAIN-OF-CUSTODY

ATTACHMENT C

LAB RESULTS

SUMMER TESTING EVENT

WINTER TESTING EVENT