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WTP-RPT-236, Rev. 0

Prepared for the U.S. Department of Energy
under Contract DE-AC05-76RL01830

Assessment of the LV-C2 Stack Sampling Probe Location for Compliance with ANSI/HPS N13.1-1999

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EJ Antonio
JE Flaherty

September 2015

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Test Specification:	N/A
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Pacific Northwest National Laboratory
Richland, Washington 99352

Completeness of Testing

This report describes the results of work and testing specified by test plan TP-WTPSP-130. The work and any associated testing followed the quality assurance requirements outlined in the test plan. The descriptions provided in this test report are an accurate account of both the conduct of the work and the data collected. Test plan results are reported. Also reported are any unusual or anomalous occurrences that are different from expected results. The test results and this report have been reviewed and verified.

Approved:

Reid A. Peterson, Manager
WTP Support Project

9/29/15
Date

Summary

This document reports on a series of tests conducted to assess the proposed air sampling location for the Hanford Tank Waste Treatment and Immobilization Plant (WTP) Low-Activity Waste (LAW) C2V (LV-C2) exhaust stack with respect to the applicable criteria regarding the placement of an air sampling probe. Federal regulations[1] require that a sampling probe be located in the exhaust stack according to the criteria established by the American National Standards Institute/Health Physics Society (ANSI/HPS) N13.1-1999, *Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stack and Ducts of Nuclear Facilities.* [2] These criteria address the capability of the sampling probe to extract a sample that represents the effluent stream.

The testing on the scale model stack conducted for this project was part of the River Protection Project—Waste Treatment Plant Support Program under Contract No. DE-AC05-76RL01830 according to the statement of work issued by Bechtel National, Inc. (BNI, 24590-QL-SRA-W000-00101, *N13.1-1999 Stack Monitor Scale Model Testing and Qualification*, Revision 1, 9/12/2007) and Work Authorization 09 of Memorandum of Agreement 24590-QL-HC9-WA49-00001. The internal Pacific Northwest National Laboratory (PNNL) project for this task is 53024, *Work for Hanford Contractors Stack Monitoring*. The testing described in this document was further guided by the Test Plan Air Sampling Probe Location Remedial Tests for Waste Treatment Plant LAW LV-C2 Air Exhaust System (TP-WTPSP-130).

The tests conducted by PNNL during 2013, 2014 and 2015 on the LV-C2 scale model system are described in this report. The series of tests consists of various measurements taken over a grid of points in the duct cross section at the designed sampling probe locations. The ANSI/HPS N13.1-1999 qualification criteria concern the following properties of the air flowing through the ducts where the air sampling probes are to be located:

1. Uniform Air Velocity—The gas momentum across the stack cross section where the sample is extracted should be well-mixed or uniform. The uniformity is expressed as the variability of the measurements about the mean, expressed as the percent coefficient of variance (%COV). It is calculated as the standard deviation divided by the mean and expressed as a percentage—the lower the %COV value, the more uniform the velocity.
2. Angular Flow—The purpose of this test is to determine whether the air velocity vector is aligned with the sampling nozzle.
3. Uniform Concentration of Tracer Gases—A uniform contaminant concentration in the sampling plane enables the extraction of gas samples that represent the true concentration.
4. Uniform Concentration of Tracer Particles— A uniform contaminant concentration at the sampling probe enables the extraction of particle samples (with particles that are large enough to exhibit inertial effect) that represent the true concentration. Particles of 10-µm aerodynamic diameter were used.

[1] Title 40 of the Code of Federal Regulations (CFR), Part 61, National Emissions Standards for Hazardous Air Pollutants (NESHAP), Subpart H, *National Emission Standard for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities*.

[2] Health Physics Society, McLean, VA 22101. The standard has been reaffirmed in 2011 and is identical to the 1999 version. The regulations have not been updated yet, so the 1999 version is still referenced.

The LV-C2 stack will have a single sampling location. The test results for the successfully-tested configuration are summarized in Table S.1. The details of the successful configuration are given in the report.

Table S.1. Summary of Sampling Probe Location Results for the LV-C2 Scale Model Stack

	Acceptance Criteria	Units	Test Port 1
Velocity Uniformity	≤20	%COV	2.1 – 5.1
Flow Angle	≤20	Degrees	1.9 – 5.5
Gas Tracer Uniformity	≤20	%COV	0.3 – 11.9
	≤30	Maximum % Deviation from Mean	0.5 – 27.6
Particle Tracer Uniformity	≤20	Normalized %COV	2.5 – 12.8

Based on the scale model tests, the location proposed for the air sampling probe in the scale model stack meet the requirements of the ANSI/HPS N13.1-1999 standard for velocity uniformity, flow angle, gas tracer and particle tracer uniformity. Additional velocity uniformity and flow angle tests on the actual stack will be necessary during cold startup to confirm the validity of the scale model results in representing the actual stack. In particular, the velocity uniformity test results for the actual stack must be within 5 %COV of the range of results listed for the scale model for the scale model results to be representative of the stack. If the velocity uniformity results on the actual stack fall within these bounds, and flow angle test results fall within qualification criteria (mean angle $\leq 20^{o}$) the scale model results may be used as a substitute for results from the actual stack.

The Waste Treatment Plant Support Program (WTPSP) implements an NQA-1-2000 quality assurance (QA) program, using a graded approach as presented in NQA-1-2000, Part IV, Subpart 4.2. The WTPSP Quality Assurance manual (QA-WTPSP-0002) describes the technology life cycle stages under the WTPSP QA plan (QA-WTPSP-0001). The technology life cycle includes the progression of technology development, commercialization, and retirement in process phases of basic and applied research and development (R&D), engineering and production, and operation until process completion. The life cycle is characterized by flexible and informal QA activities in basic research, which becomes more structured and formalized through the applied R&D stages. The work described in this report has been completed under the QA Technology level of Developmental Work as the data will be used to apply for air discharge permits.

WTPSP addresses internal verification and validation activities by conducting an Independent Technical Review of the final data report in accordance with WTPSP's procedure QA-WTPSP-0601, *Document Preparation and Change*. This review verifies that the reported results are traceable, that inferences and conclusions are soundly based, and the reported work satisfies the test plan objectives. Appendix A lists the reviewed test plan, test instructions, and calculation packages used for the tests documented in this report.

Acronyms

acfm	actual cubic feet per minute
AD	aerodynamic diameter
afpm	actual feet per minute
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
BNI	Bechtel National, Inc.
CCP	computer-assisted calculation package
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
DV	hydraulic diameter × mean velocity
EPA	U.S. Environmental Protection Agency
FA	flow angle test
GT	gaseous tracer test
HDI	"How Do I…?"
HPS	Health Physics Society
LAW	low-activity waste
LV-C2	low-activity waste non-process area ventilation exhaust
N_2O	nitrous oxide
NCR	Non-Conformance Report
NESHAP	National Emissions Standards for Hazardous Air Pollutants
OPC	optical particle counter
%COV	percent coefficient of variation
PNNL	Pacific Northwest National Laboratory
PT	particle tracer test
QA	quality assurance
scfm	standard cubic feet per minute
TI	test instruction
VT	velocity uniformity test
WTP	Hanford Tank Waste Treatment and Immobilization Plant
WTPSP	Waste Treatment Plant Support Program

Acknowledgments

Preparing, executing, and post-processing these scale model measurements involved a number of Pacific Northwest National Laboratory staff. We would like to particularly acknowledge the support of our quality engineer, Kirsten Meier, and the administrative support from Chrissy Charron and Mona Champion. We would also like to express our appreciation to scientific staff members Carmen Arimescu and Yin-Fong Su, who conducted measurements under a variety of weather conditions. Additionally, Matthew Barnett, and Carmen Arimescu, provided technical reviews. Megan Peters provided editorial support for this report.

Funding for this effort was provided by the Department of Energy's Waste Treatment and Immobilization Plant Project through a subcontract with Bechtel National, Inc. Pacific Northwest National Laboratory is operated for the U.S. Department of Energy by Battelle under Contract DE-AC05-76RL01830.

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1.0 Introduction

This set of scale model tests was performed to document whether the current design for the air monitoring location at one air exhaust stack in the Hanford Tank Waste Treatment and Immobilization Plant (WTP) meets the applicable regulatory criteria governing effluent monitoring systems. A group (Test Group 1-2A) tested together, originally consisted of three Low-Activity Waste (LAW) facility stacks: LV-C2, LV-S2, and LV-S3 (i.e., the emission units for the LAW C2V, LAW C5V, and the LAW secondary offgas / vessel vent process system [LVP], respectively). The LV-C2 stack, however, required further testing due to deficiencies in the original test results, and are therefore reported separately here.

The emissions from this low-activity waste facility air exhaust stack may exceed the 0.1-millirem per year threshold limit given in Title 40 of the Code of Federal Regulations (CFR), Part 61, National Emissions Standards for Hazardous Air Pollutants (NESHAP), Subpart H, *National Emission Standard for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities*. The NESHAP rule requires that a sampling probe be located in the exhaust stack according to criteria established by the American National Standards Institute/Health Physics Society (ANSI/HPS) N13.1-1999, *Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stack and Ducts of Nuclear Facilities.*[1] The capability of the sampling probe location in the LV-C2 stack to meet this standard has been demonstrated with a series of tests on a scale model of the stack. These data will be used by Bechtel National, Inc. (BNI) as input to the air discharge permitting process.

This work is performed as part of the River Protection Project—Waste Treatment Plant Support Program under Contract No. DE-AC05-76RL01830 according to the statement of work issued by BNI, 24590-QL-SRA-W000-00101, N13.1-1999 Stack Monitor Scale Model Testing and Qualification, Revision 1, 09/12/2007 and Work Authorization 09 of Memorandum of Agreement 24590-QL-HC9-WA49-00001. The internal Pacific Northwest National Laboratory (PNNL) project for this task is 53024, *Work for Hanford Contractors Stack Monitoring*.

PNNL personnel conducted the original scale model tests during 2013 and the remedial tests in 2014 and 2015. No BNI personnel were directly involved in the tests. The BNI WTP point of contact and facility engineers provided the most current engineering input to support PNNL's tests. BNI retains responsibility for the technical design of the stack discharge and air monitoring systems.

1.1 Qualification Criteria

The qualification criteria for the location of a stack air monitoring probe are taken from ANSI/HPS N13.1-1999, Section 5.2.2 and are paraphrased as follows:

1. Uniform Air Velocity—It is required that the air velocity be fairly uniform across the stack cross section where the sample is extracted. Consequently, the velocity is measured at several discrete points in the duct cross section at the proposed location of the sampling nozzle. The uniformity is expressed as the variability of the measurements about the mean. This is expressed using the percent

[1] Health Physics Society, McLean, VA 22101. The standard has been reaffirmed in 2011 and is identical to the 1999 version. The regulations have not been updated yet, so the 1999 version is still referenced.

coefficient of variation (%COV),[1] which is the standard deviation divided by the mean and expressed as a percentage—the lower the %COV value, the more uniform the velocity. The qualification criterion is that the %COV of the air velocity must be ≤20% in the center two-thirds of the duct cross section where the sampling probe is to be located.

2. Angular Flow—Sampling nozzles are typically aligned with the axis of the stack. If the air travels through the stack in cyclonic fashion, the air velocity vector approaching a sampling nozzle could be sufficiently misaligned with the nozzle to impair extraction of particles. Consequently, the flow angle is measured at the proposed location of the sampling probe. The average of the flow angle measurements (made at the same grid of points as the velocity measurements) should not exceed 20° relative to the sampling nozzle axis.
3. Uniform Concentration of Tracer Gases—A uniform contaminant concentration in the sampling plane enables the extraction of samples that represent the true concentration within the duct. The uniformity of the concentration is first tested with a tracer gas to represent gaseous effluents. The fan is a good mixer, so injecting the tracer downstream of the fan provides worst-case results. The qualification criteria are that 1) the %COV of the measured tracer gas concentration is ≤20% across the center two-thirds of the duct cross section at the sampling location, and that 2) the concentrations at any of the measurement points cannot deviate from the mean by >30%.
4. Uniform Concentration of Tracer Particles—The second set of tests addressing contaminant concentration uniformity at the sampling position uses tracer particles large enough to exhibit inertial effects. Tracer particles of 10-μm aerodynamic diameter (AD) are used by default unless it is known that larger contaminant particles will be present in the airstream. The qualification criterion is that the %COV of particle concentration is ≤20% across the center two-thirds of the duct at the sampling location.

Tests to determine if criteria 1 through 4 were met were conducted on the LV-C2 scale model at the proposed sampling location along the exhaust duct. By conducting tests on a scale model of the exhaust system, the designed air sampling locations can be qualified before cold commissioning, and compensatory measures could be made in the design if testing results were not satisfactory. All of the tracer concentration, velocity, and flow angle measurements were made using the same grid of points in a given cross section of the duct. The ANSI/HPS N13.1-1999 standard sets additional qualification criteria for the use of a scale model as a substitute for the actual stack:

- The scale model and its sampling location must be geometrically similar to the actual stack.
- The product of the hydraulic diameter and the mean velocity (DV) for the scale model must be within a factor of six of the DV for the actual stack.
- The Reynolds number for the actual and model stacks must be >10,000.
- The scale model results are considered valid if it is further shown that:
  - The velocity profile in the actual stack meets the uniformity criterion (%COV ≤20%).
  - The velocity uniformity COV values for the actual and model stacks agree within 5 %COV.
  - The flow angle criterion (with a mean value less than or equal to 20°) is met.

[1] *Coefficient of variation* is considered "dated" terminology. The modern terminology is *percent relative standard deviation*. However, because the standard uses the older terminology, it will likewise be used here.

The tests to determine the validity of the scale model testing will be performed during cold startup testing on the actual WTP stacks under a separate test plan. The scale model testing conducted, as well as the results of these tests, are described in subsequent sections of this report.

2.0 LV-C2 Stack

2.1 Stack Geometry

The scale model design is based on assumptions about the necessary simulation detail. These assumptions are listed below.

- Flows induced by natural convection due to temperature gradients are negligible compared to flows driven by forced currents from the fans. Therefore, gravitational impacts are negligible and the vertical orientation of the full-scale stack can be modeled in a horizontal configuration.
- Sampling at the sample port location from two test ports 90 degrees apart provides representative characterization of stack flow. It is unnecessary to mimic the angular orientation of test ports relative to upstream elbows (or bends).
- WTP design injection port locations will *initially* be assumed to be adequate on account of the high Reynolds number and sufficient length of straight duct from the last elbow to the sampling location. If data analysis indicates that the WTP injection location does not provide representative sampling WTP will be notified and testing from other injection locations (farther upstream) may be conducted to achieve data representative of a well-mixed system.
- Temperature has negligible effect on the mixing given that the temperature from either fan would be the same. Model testing will not seek to match temperature conditions of the WTP system.
- Backdraft dampers and control dampers on the standby fan are assumed to be fully closed such that there is no leakage back to the LAW ventilation system. During model testing, the operating fan(s) will be utilized for testing and the standby fan will be isolated.
- The measurement uncertainty for each test type (e.g., velocity, flow angle, tracer) depends only upon the measurement (instruments and procedures) and not upon the fan configuration or flow condition. The air velocity and tracer uniformity downstream of the dampers would not be greatly influenced by equipment upstream of the dampers.
- Backdraft damper blades do not usually open fully, so the partially open blades direct the air velocity vector toward one side of the duct, significantly disrupting the air flow and possibly washing out the effect of upstream disturbances.

In the LV-C2 stack, the designed sampling probes will be located in vertical sections of duct. Figure 2.1 shows the layout for the stack design, from the fan outlet to the outlet of the vertical duct. Figure 2.2 shows the scale model layout for the stack design. Test Port 1 represents the planned location for the record sampling system sample port Figure 2.1. The scale model system had an additional port located five duct diameters downstream of Test Port 1, used to monitor the output of the aerosol generator during particle tracer uniformity testing.

The scale model was constructed with a primary duct diameter of 12 in. for convenience and to maintain the ability to re-use the duct sections for subsequent stack designs. The diameter of the actual stack is 60 inches yielding a scaling factor of one-fifth for the 12-in. scale model diameter. The calculations of the key scale model dimensions were performed in spreadsheets and then verified and validated in accordance with appropriate quality assurance (QA) procedures. ANSI/HPS N13.1-1999

requires that the models be geometrically similar to the actual stacks. Acceptable deviations in key dimensions of the scale model arising from scaling and fabrication errors are within about ±5% for cross-sectional dimensions and about 25% of a duct diameter in overall length between the sampling point and the flow disturbances. These deviations would have less impact on the test results than the normal standard deviation of repeat tests. The key scale model dimensions for the as-built scale models were measured and recorded by testing staff.

The LV-C2 stack was originally tested as part of a group of three LAW stacks referred to as Test Group 1-2A. However, the LV-C2 model required additional testing because the particle tracer tests failed to meet the acceptance criteria when one of the fans was operating at its maximum flow condition. Also, BNI designers re-estimated the system flowrates and the new estimates were significantly lower than for the previous tests.

A visit to the Vitrification Plant was made to compare the scale model to the constructed stack. The comparison showed that the backdraft dampers used on the model (used from a previous model, to save costs), were oversized and had damper blades that were oriented incorrectly relative to the axis of flow. Scale model tests performed in the past did not indicate that backdraft dampers would significantly influence the test results. However, the LV-C2 stack is fairly simple (just a single bend), and short (only ten duct diameters between the bend and sampling location), so it is reasonable to expect that the initial geometry would have a greater influence on the test results.

Several potential remedial actions were considered for the LV-C2 scale model tests:

- Relocate the sampling point farther downstream,
- Correctly orient the oversized dampers,
- Install correctly scaled dampers,
- Locate tracer injection ports further upstream,
- Install a static mixer between the fans and the base of the stack.

Additional scale model tests were performed to investigate the effect of implementing the first four of these remedies.

First, additional particle tracer tests were performed to compare the oversized dampers in the correct orientation with those that were offset by 90° at both the original flow conditions and at the revised, lower flowrate conditions. Subsequently, scaled control and backdraft dampers were fabricated and particle tracer tests were performed with sampling performed at Test Port 1 (the planned sampling port for the stack) and at test ports inserted at one duct diameter and two duct diameters downstream of Test Port 1. For these tests, the tracer material was injected at Injection Ports I2, I3 and I5, which, given their upstream locations, maximizes mixing. The oversized and scale model dampers are shown in Figure 2.3.

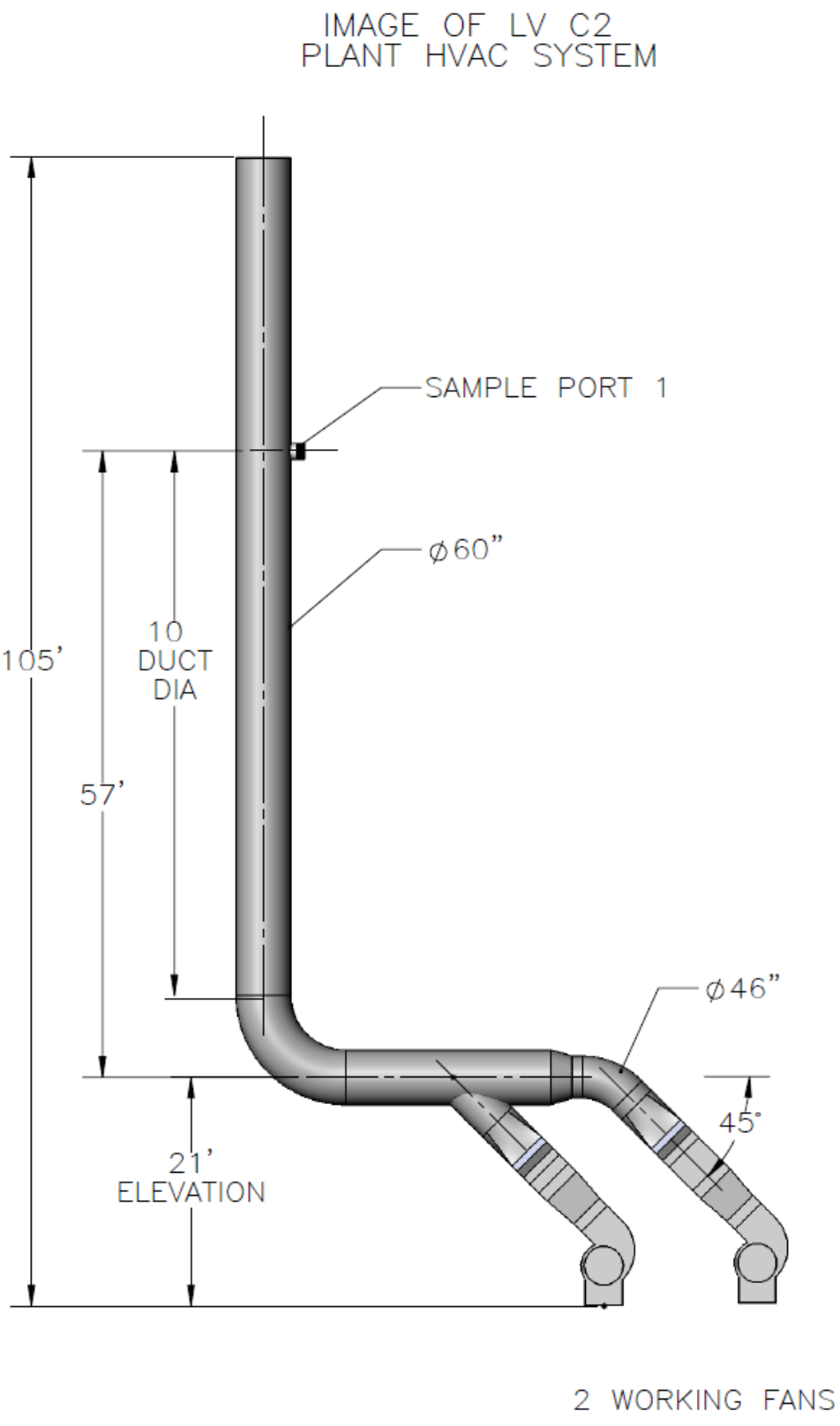


Figure 2.1. LAW C2V (LV-C2) System Per Design

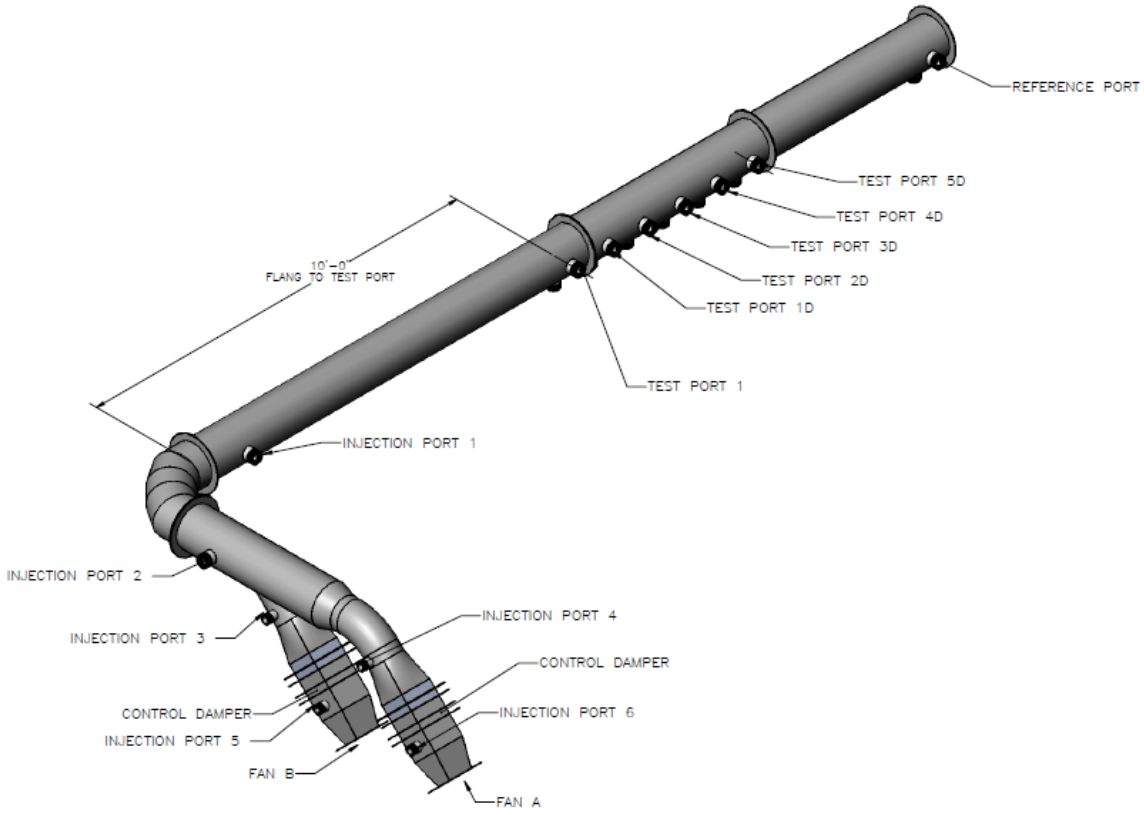


Figure 2.2. Layout of LAW C2V (LV-C2) Scale Model Test System

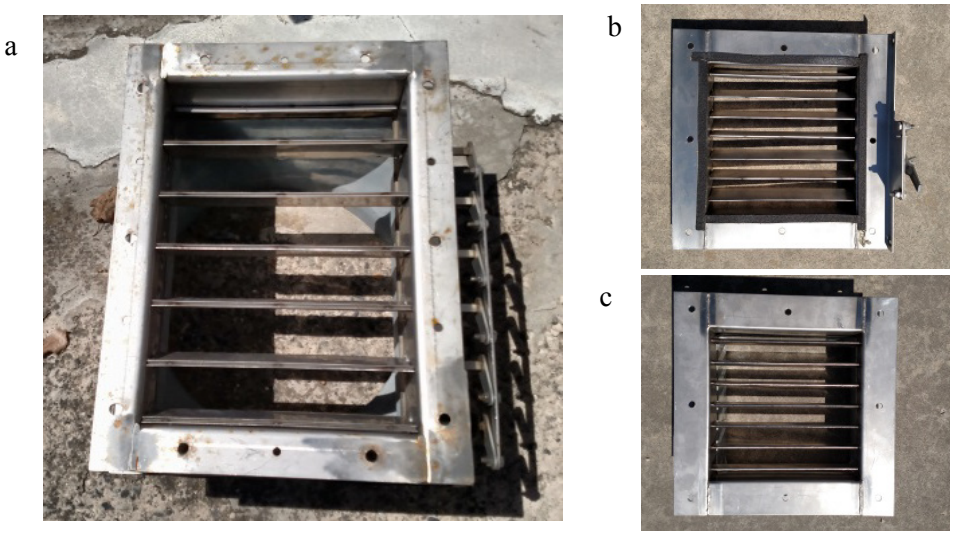


Figure 2.3. Photographs of: a) Oversized Backdraft Damper; b) Scale Model Backdraft Damper; and c) Scale Model Control Damper

2.2 Stack Flows

Tests of the scale model stack were conducted at flow rates that bracket the range of expected normal and accident flow rates and operating configurations. Various combinations of flow rates and operating fans were tested. BNI provided normal, minimum, and maximum flow rates.

Additional considerations come from the ANSI/HPS N13.1-1999 standard. The standard requires that the DV of the scale model be within a factor of six of the actual stack. For stacks with a circular cross section, this is equivalent to requiring that the ratio of flow rate to stack diameter be within a factor of six of the actual stack. The standard also requires that the Reynolds number for the prototype and model stacks must both exceed 10,000.

There are two fans available to power the LAW C2V (LV-C2) exhaust system, which exhausts the air from the C2 ventilation system of the low-activity waste facility. One fan will be operated at a time, and one will be on standby. Each fan is capable of providing the design maximum flow rate, and is equipped with an adjustable-speed drive to compensate for filter loading and pressure variations.

BNI provided estimated flow rates, in standard cubic feet per minute (scfm), and temperatures for the operation of LV-C2 as shown in Table 2.1. The previous and updated flow rates (CCN 270918) are both given in the table. The table also shows the calculated volumetric flowrate, actual cubic feet per minute (acfm), taking the temperature and updated flow rates into account. BNI uses 14.7 psia and 68°F as standard gas conditions for ventilation. Flow parameters used in subsequent sections will be at the estimated conditions.

Table 2.1. Provided Flow Rate and Temperature Converted to Actual Flow Rates

			BNI Provided Data			Calculated	
Emission Unit	Duct Diameter in.	Operating Condition	*Previous scfm*	Updated scfm	Updated Temperature °F	*Previous acfm*	Updated acfm
LV-C2	60	Maximum	*68,000*	55,550	140	*76,981*	63,130
LV-C2	60	Normal	*54,000*	50,500	95	*56,547*	53,084
LV-C2	60	Minimum	*37,800*	33,800	59	*36,374*	33,224

Table 2.2 summarizes the flow conditions for the actual and scale model stacks. The minimum air flow (in acfm) and air velocity (in actual feet per minute [afpm]) to achieve the assumed minimum and maximum actual stack flow are listed. The tabulated values of flow and velocity in the "Scale Model Minimum" columns are the minimum scaled values that will meet the criterion listed in Section 1.1 that the DV product be within a factor of six of the prototype. The scale model Reynolds numbers are calculated for those minima. One of the qualification criteria listed in Section 1.1 is that the Reynolds number for both the actual and scale model stack must be greater than 10,000. Therefore, the Reynolds numbers for the actual and scale model stacks at the minimum and maximum flow rates are included in Table 2.2. The conditions prescribed for these scale model tests fulfill the criterion of a Reynolds number greater than 10,000.

Table 2.2. Summary of Flow Parameters for LV-C2 Scale Model Stack

	Air Flow (acfm)		Air Velocity (afpm)		Reynolds Number	
Flow	Actual Stack	Scale Model Minimum	Actual Stack	Scale Model Minimum	Actual Stack	Scale Model Minimum
Max flow	63,130	2,104	3,215	2,679	1.3E+06	2.2E+05
Normal flow	53,084	1,769	2,704	2,253	1.3E+06	2.1E+05
Min flow	33,224	1,107	1,692	1,410	9.0E+05	1.5E+05

As listed in Section 1.1, the qualification criteria include a constraint on the DV value of the scale model relative to the actual stack. For comparison between the tests on the scale models and the acceptable DV range, DV values are tabulated in Table 2.3. They are calculated for each of the three flow conditions for each stack. The acceptable DV range (1/6 to 6× that of the actual stack) is quite large, and the upper end of the range is impractical with real-world blowers. Usually, during testing, an upper velocity approximately equal to that of the actual stack is selected for use. With the use of variable frequency drives to control the blowers, the velocity corresponding to the lower end of the DV range is practical, and this velocity (or a slightly higher velocity) is typically used.

Note that because the scale model stack diameter is one foot, that the DV values in Table 2.3 are equal to the velocity values for the scale model. For example, the LV-C2 minimum DV, which is 1410 ft^2/min, corresponds to a velocity of 1410 ft/min for the 1-ft-diameter scale model.

Table 2.3. Summary of DV Values for Scale Model Stacks

Stack	**DV, ft^2/min**	**Min**	**Norm**	**Max**
LV-C2	Actual Stack	8,460	13,520	16,075
	Min. for Model	1,410	2,253	2,679
	Max. for Model	50,760	81,120	96,450

3.0 Testing Methods

The testing methods were based on the requirements of ANSI/HPS N13.1-1999. A test plan, TP-WTPSP-130, *Air Sampling Probe Location Tests for Waste Treatment Plant LAW LV-C2 Air Exhaust System*, was prepared by PNNL and approved by BNI. This plan referenced the use of PNNL procedures, which define how the test should be conducted in general. A test instruction (TI) was prepared for each test type and for the scale model stack. These TIs contain specific instructions pertaining to the tests that are not addressed in the general procedures. Such information includes the following:

- Layout of measurement points
- Locations of tracer injection points
- List of equipment and instrumentation
- Safety requirements
- List of minimum test runs
- Test description and measurement data sheets with hand entries
- Table of preliminary results.

Because the final data sheets and a description of the test methods are included in this report, the TIs are not included here. The QA program that is implemented for this project is described in Section 3.1 and a summary of the stack testing methods used for each of the four test types is presented in Section 3.2.

3.1 Quality Assurance

The PNNL QA program is based on the requirements defined in the U.S. Department of Energy Order 414.1D, *Quality Assurance,* and 10 CFR 830, *Energy/Nuclear Safety Management*, and Subpart A—*Quality Assurance Requirements* (a.k.a. the Quality Rule). PNNL has chosen to implement the following consensus standards in a graded approach:

- ASME NQA-1-2000, *Quality Assurance Requirements for Nuclear Facility Applications*, Part I, "*Requirements for Quality Assurance Programs for Nuclear Facilities*".
- ASME NQA-1-2000, Part II, Subpart 2.7, *Quality Assurance Requirements for Computer Software for Nuclear Facility Applications*.
- ASME NQA-1-2000, Part IV, Subpart 4.2, *Guidance on Graded Approach Application of Quality Assurance (QA) Requirements for Nuclear-Related Research and Development*.

The procedures necessary to implement the requirements are documented through PNNL's "How Do I…?" (HDI), which is a system for managing the delivery of laboratory-level policies, requirements, and procedures.

The Waste Treatment Plant Support Program (WTPSP) implements an NQA-1-2000 QA program, using a graded approach as presented in NQA-1-2000, Part IV, Subpart 4.2. The WTPSP Quality Assurance manual (QA-WTPSP-0002) describes the technology life cycle stages under the WTPSP QA

plan (QA-WTPSP-0001). The technology life cycle includes the progression of technology development, commercialization, and retirement in process phases of basic and applied research and development (R&D), engineering and production, and operation until process completion. The life cycle is characterized by flexible and informal QA activities in basic research, which becomes more structured and formalized through the applied R&D stages. The work described in this report has been completed under the QA Technology level of Developmental Work as the data will be used for applying for air discharge permits.

- DEVELOPMENTAL WORK—Developmental work consists of research tasks moving toward technology commercialization. These tasks still require a degree of flexibility, and there is still a degree of uncertainty that exists in many cases. The role of quality on developmental work is to make sure that adequate controls exist to support movement into commercialization.

WTPSP addresses internal verification and validation activities by conducting an Independent Technical Review of the final data report in accordance with WTPSP's procedure QA-WTPSP-0601, *Document Preparation and Change*. This review verifies that the reported results are traceable, that inferences and conclusions are soundly based, and the reported work satisfies the test plan objectives. Appendix A lists the reviewed test plan, test instructions, and calculation packages used for the tests documented in this report.

3.2 Stack Tests

The tests described in the following subsections were conducted under scale flow conditions designed for the LV-C2 stack, which were listed in Table 2.2. The test matrix included with the test plan described the minimum number of tests that were planned for each stack. The actual number of tests typically exceeded the planned number because tests were added to confirm results.

Before conducting the tests to determine whether the four qualification criteria described in Section 1.1 were met for each stack, two other measurement sets were made. First, the major features of the stack were measured. The longitudinal distances from the fans to the bends, duct reducers, and ports were determined, in addition to the duct diameter at each measurement port. The second set of measurements determined the fan frequency settings needed to achieve the desired flow rates. For these measurements, the location within the duct cross section that had velocity measurements closest to the mean velocity was determined for the test port. Then, velocity measurements were made at this single measurement point at 5-Hz increments in the fan frequency setting. By developing a frequency-vs.-velocity relationship for the scale model stack, the frequency setting needed to achieve the flow conditions could be pre-determined. The data sheets from these velocity calibration tests are included in Appendices B.1 and C.1.

A common grid of measurement points in the duct cross section was used for each of the qualification criteria tests described in the following subsections. The number and distance between measurement points were based on the U.S. Environmental Protection Agency (EPA) procedure 40 CFR 60, Appendix A, Method 1, for circular stacks. For a 12-in. duct diameter, eight traverse points are required at the relative positions shown in Figure 3.1. Measurements also were made at the centerpoint. In lieu of making the two measurement points nearest to the walls at 3.2% of the duct diameter from the duct walls, the minimum distance from the wall was set to 0.5 in., as prescribed by EPA Method 1. The measurement point closest to the port was Point 1, while the point farthest from the port was Point 8.

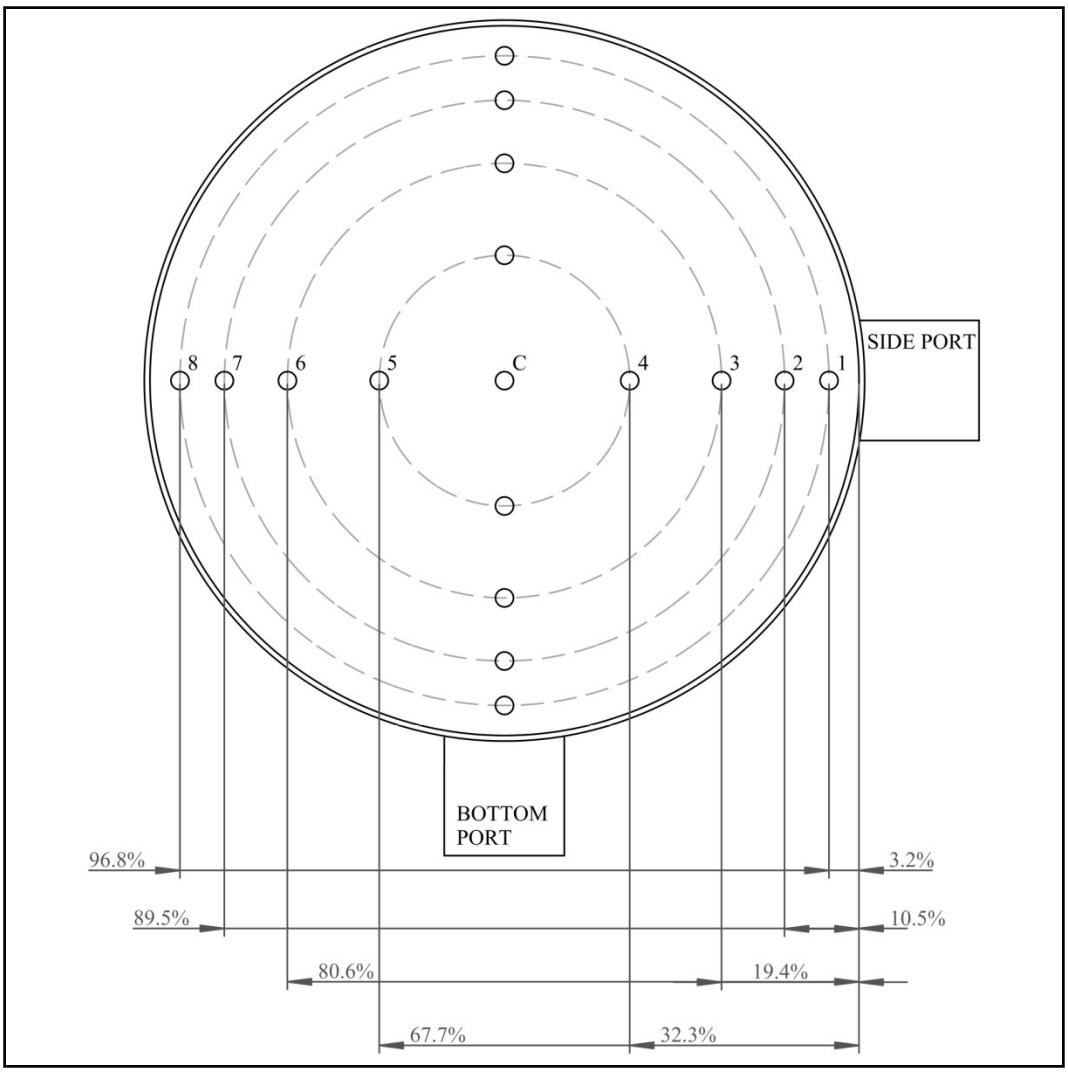


Figure 3.1. Cross Section of the Duct at the Testing Ports with Measurement Points

3.2.1 Velocity Uniformity

The uniformity of air velocity at the stack monitoring location indicates whether the momentum in the stack is well-mixed. The method used to conduct the velocity uniformity tests was based on 40 CFR 60, Appendix A, Method 1. The velocity uniformity criterion is that the %COV should be less than 20% in the center two-thirds of the duct (measurement points 2-7).

For each test run, three air velocity readings were obtained at each measurement point in the cross section of the duct. The measured velocity was the average of the three readings. The measured velocity for each point was used to determine the mean and standard deviation of the velocity across the cross-sectional plane. The %COV (a.k.a. the percent relative standard deviation) was calculated as 100 times the standard deviation divided by the mean.

Air velocity measurements were made using a handheld thermal anemometer (TSI, Model 9545, Shoreview, MN). Duct air temperature measurements also were made with the same handheld thermal

anemometer. The thermal anemometer is capable of reporting velocity in standard feet per minute, with standard conditions defined as 1 atm and 70°F, or in actual feet per minute using the actual air temperature measured by the thermal anemometer and the actual barometric pressure measured with another instrument and input to the anemometer. Figure 3.2 shows the thermal anemometer used for this test. The procedure EMS-JAG-04 and test instructions TI-WTPSP-114 and TI-WTPSP-120 were followed to conduct this test for the scale models.

Figure 3.2. Equipment Used for the Velocity Uniformity Test (a) Thermal Anemometer, and (b) Close-Up View of Thermal Anemometer Probe Tip

3.2.2 Flow Angle

The air velocity vector approaching the sample nozzle should be aligned with the axis of the nozzle within an acceptable range so that the sample extraction performance is not degraded. The test method is based on 40 CFR 60, Appendix A, Method 1, Section 11.4, "Verification of the Absence of Cyclonic Flow." The term "flow angle" refers to the angle between the velocity vector of the flow in the duct and the axis of the sampling nozzle. For the stack testing activities, the flow angle was measured at a grid of nine points across two axes in a cross section of the duct (see Figure 3.1). The qualification criterion for the flow angle test is that the average angle should not exceed 20°.

The flow angle measurements were made using an S-type Pitot tube (Dwyer Instruments, 160S-36, Michigan City, IN) attached by flexible tubing to a slant-tube manometer (Dwyer Instruments, 400-5, Michigan City, Indiana) and an angle-indicating device attached to the sampling port as shown in Figure 3.3. For this test, the S-type Pitot tube is rotated so that the planes of the two open ends of the two tubes are parallel to the long axis of the duct. The pitot tube is then rotated about its long axis until the

differential pressure across the open ends of the tubes reads zero on the manometer. The rotation angle is read from the angle-indicating device. The measured flow angle for each point is the average of three readings. These measured values are used to calculate the mean absolute value of the flow angle across the duct. The procedure EMS-JAG-05 and test instructions TI-WTPSP-115 and TI-WTPSP-121 were used to conduct this test for each of the scale models.

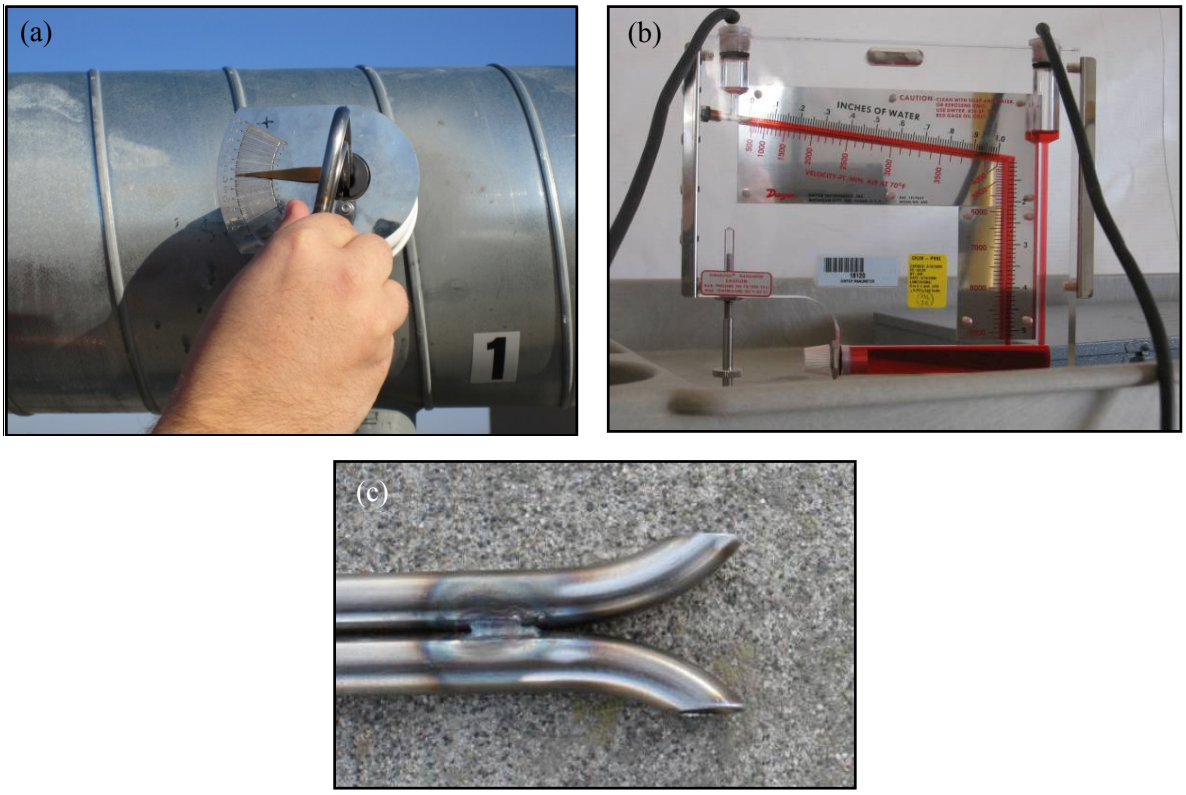


Figure 3.3. Equipment Used for the Flow Angle Test: (a) S-type Pitot Tube Inserted in a Test Port with the Angle-Indicating Device, (b) Slant-Tube Manometer, and (c) Openings at Tip of S-Type Pitot Tube

3.2.3 Gaseous Tracer Uniformity

The gaseous contaminant concentration uniformity was demonstrated using the tracer gas nitrous oxide (N_2O). A compressed gas cylinder and a flow controller were used to deliver a constant stream of N_2O into the duct. The gaseous tracer was typically injected into the duct at a point downstream of the fans. Figure 3.4 shows the injection locations with an injection probe positioned in the port. For separate test runs, the injection probe is positioned at one of five different locations in the duct cross section as illustrated in Figure 3.5 for circular ducts. The remaining four injection locations are within a specified distance of the duct wall. For a nominally 12-in.-diameter duct, the four "wall" injection locations were located within 2.4 in. of the wall.

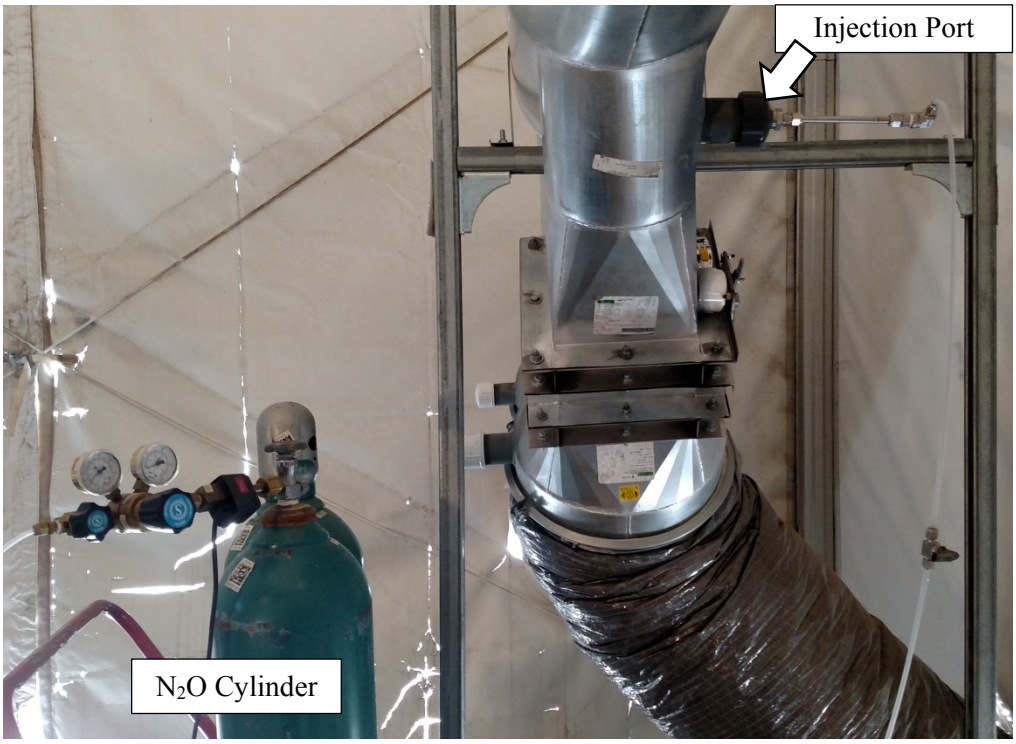


Figure 3.4. Equipment Used for the Gaseous Tracer Injection. Injection Probe Installed in the Scale Model and Cylinder of Pure N_2O with Heater and Regulator.

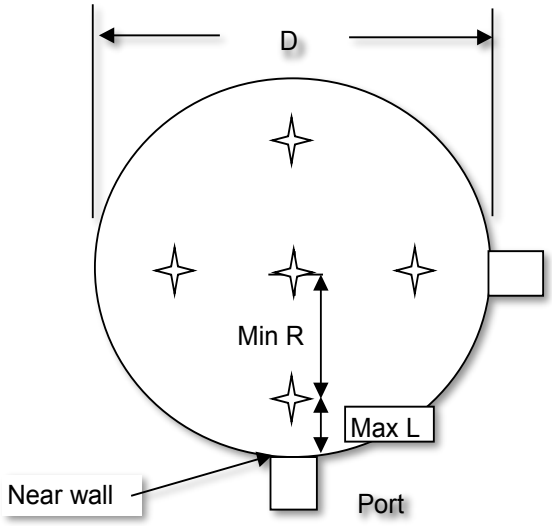


Figure 3.5. Illustration of Five Injection Points in a Circular Duct. Note: Max L is the maximum distance from the wall, which is 20% of the hydraulic diameter. Therefore, Min R, the minimum radius from the duct center, is 80% of the hydraulic diameter. In the case of a circular duct, the hydraulic diameter is equal to the physical diameter (D).

For each test run, the tracer concentration was read three times at each of the measurement points across the duct. The measured concentration for each point is the average of the three readings. These measured concentrations are used to calculate the overall mean, standard deviation, and %COV. These

calculations also are performed just for the measurement points in the center two-thirds of the duct. The qualification criteria for the gaseous tracer test are that 1) the %COV should be ≤20% within the center two-thirds of the duct, and 2) the concentration at any measurement point should not deviate from the overall mean by more than 30%.

A photoacoustic gas analyzer (Brüel & Kjær, Model 1302, Ballerup, Denmark) was used to measure tracer gas concentrations. The concentration variation is the important result for this test, so calibration bias is not important in the test results. However, the analyzer response was checked with calibration standards before and after conducting the test series (as well as weekly during the test series) to verify an adequate instrument response. The response was considered acceptable if the concentration from the instrument was within 10% of the calibration standard.

A simple probe was used to extract the sample and deliver it to the gas analyzer. A small pump drew air from within the stack through the probe. The gas analyzers then sampled the air from the sample line for analysis (Figure 3.6). The procedure EMS-JAG-01, Rev 4 and test instructions TI-WTPSP-117 and TI-WTPSP-122 were used to conduct this test for each scale model.

Figure 3.6. Equipment Used for the Gaseous Tracer Sampling: (a) Sampling Probe Installed in a Port, (b) Sampling Pump, and (c) Gas Analyzer

3.2.4 Particle Tracer Uniformity

The uniformity of the particulate contaminant concentration was demonstrated using polydisperse vacuum pump oil particles as a particle tracer. The oil was drawn into a spray nozzle (driven by compressed air) housed in a stainless steel chamber. These aerosol particles were injected into the duct air at an injection point downstream of the fans as shown in Figure 3.7. Figure 3.7 shows the equipment setup for an aerosol injection in the LV-C scale model stack. The stainless steel chamber and spray

nozzle assembly is also referred to as the aerosol generator. In previous tests, an aerosol generator of similar design, except constructed out of PVC, was used. The aerosol was injected at the centerline of the duct, and this test was repeated to gain some sense of the variability of the results.

Figure 3.7. Equipment Used for Particle Injection

The concentration of the particles is measured at the sampling grid points with a calibrated optical particle counter (OPC) (Hach, Met-One Model 3415, Loveland, CO). A simple probe was used to extract the sample and deliver it to the OPC. Figure 3.8 shows the sampling setup with the simple probe connected to the OPC. To identify potential inconsistencies in the aerosol output, tests were conducted with a reference instrument measuring the particle concentration at a location downstream of the test port. The OPC sorts the particles into eight size channels. As mentioned in Section 1.1, the particles of interest have an AD of 10 μm. Therefore, only data in the 9- to 11-μm channel of the OPC were used.

The particle concentration was read three times at each of the measurement points across the cross section of the duct. The measured concentration for each point is the average of the three readings. From these measurements, the overall mean, standard deviation, and %COV were calculated for all of the points and also just for those within the center two-thirds of the duct. The qualification criterion for the particle tracer test is that the %COV should be less than or equal to 20% within the center two-thirds of the duct. The procedure EMS-JAG-02 and test instructions TI-WTPSP-116 and TI-WTPSP-123 were used to conduct this test.

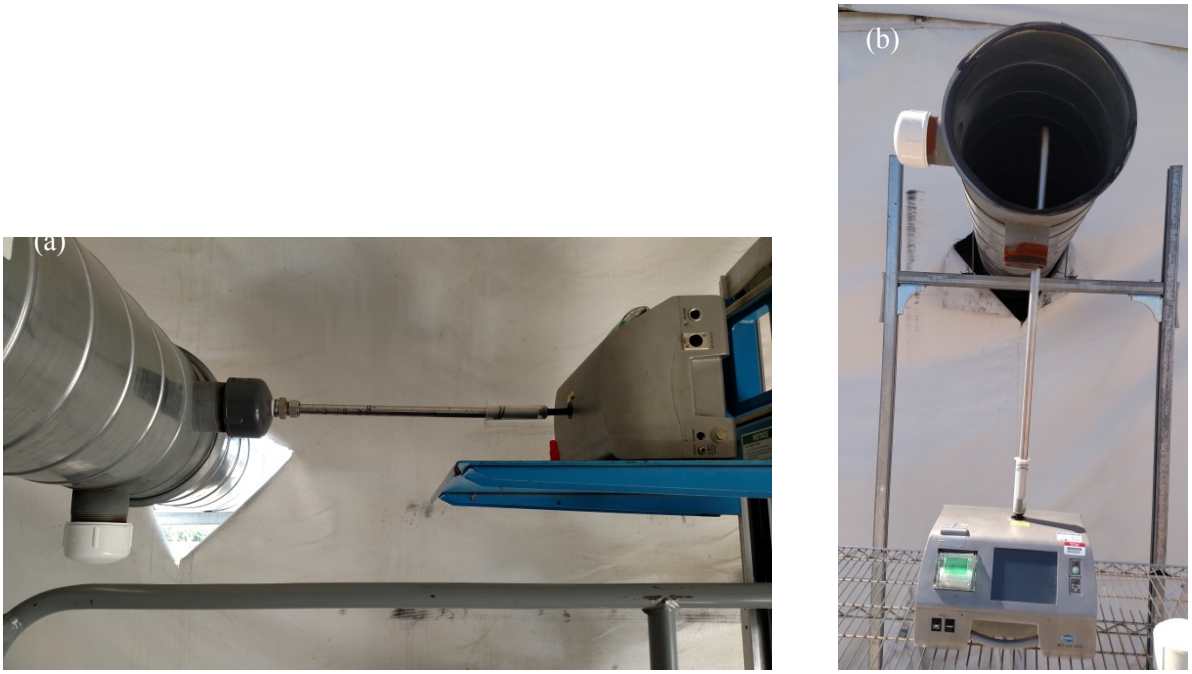


Figure 3.8. Particle Counters Used for the Particle Sampling. (a) Optical Particle Counter for Measurement Data in Side Port of LV-C2 Scale Model System; (b) Fixed Position Reference Optical Particle Counter in Bottom of LV-C2 Reference Port.

4.0 LV-C2 Stack Testing Results

This section summarizes the results of the stack testing activities for the retest of the LV-C2 scale model stack. The primary, reportable results are the data and data calculations to confirm that the requirements of the ANSI/HPS N13.1-1999 standard have been met. Independent reviews were performed to verify the data transcription and calculations. These calculations were performed using Excel (2010) and documented in computer-assisted calculation packages (CCPs) in accordance with WTPSP procedures. The final data sheets for the LV-C2 tests are included in Appendices B and C, respectively. Appendix A contains a list of supporting documentation (such as the test plan and test instructions) used with this scale model Test Group.

The scale model stack underwent a series of velocity uniformity tests (designated VT), flow angle tests (designated FA), gas tracer tests (designated GT) and particle tracer tests (designated PT). Tables summarizing the results of tests for the scale model are presented in subsections of this section. It is possible that during some tests the scale model velocity values were higher than the actual stack flow for the conditions the test was meant to represent. This is acceptable because the DV value was still within a factor of six of the stack design values, and the facility flow conditions are estimates and may vary significantly from the design conditions at times for a variety of reasons.

The LV-C2 stack was originally tested as part of a group of three LAW stacks referred to as Test Group 1-2A. The original test results are not summarized in this section of the report, but summary tables and the datasheets are included as Appendix B for completeness.

Summary tables of the data for Test Port 1 for LV-C2 retest flow angle, velocity, gas tracer, and particle tracer test results are presented in the following subsections. Some test combinations were repeated (i.e., performed more than once at different times) to quantify the testing and response measurement uncertainty.

4.1 LV-C2 Retest Velocity Uniformity

Table 4.1 lists the results for the velocity uniformity tests performed on the retest of the scale model LV-C2 stack. In all cases, the results were well within the criterion of %COV values ≤ 20%. Velocity uniformity results were typically below 5%. The velocity in the stack ranged from 1437 to 3235 afpm (1114 to 2508 acfm). Table 2.2. lists the desired range of minimum scale model flow rates as 1410 to 1692 afpm (1105 to 2137 acfm). The desired testing conditions were between the minimum scale model flow rate and the actual stack velocity. With these flow conditions, the scale model meets both the Reynolds number and DV criteria required to represent the actual stack. The completed data sheets from these tests are available in Appendix C, Subsection C.1.

Table 4.1. Summary of LV-C2 Retest Velocity Uniformity Tests

Operating Fan	Flow Condition	Run No.	Flow (acfm)	Approx. Air Velocity (afpm)	%COV
A	Max	VT-12	2414	3115	2.1
	Norm	VT-16	1973	2545	2.5
	Min	VT-13	1217	1570	2.7
		VT-14	1212	1563	2.6
		VT-15	1214	1565	2.7
B	Max	VT-1	2508	3235	3.4
		VT-2	2471	3188	4.4
		VT-3	2461	3174	4.2
	Norm	VT-5	1982	2556	2.8
		VT-6	2158	2783	4.9
		VT-7	1814	2340	5.2
	Min	VT-4	1114	1437	5.1
A&B	Max	VT-8	2261	2917	3.7
		VT-9	2263	2920	3.2
		VT-10	2255	2908	3.3
	Min	VT-11	1202	1551	3.7

Note: Individual and replicate sets of tests are alternately shaded and unshaded.

4.2 LV-C2 Retest Flow Angle

Table 4.2 lists the results for the flow angle tests performed on the retest of the LV-C2 scale model stack. The results for all tests were well within the criterion of flow angle values ≤20°. Fan A flow angles ranged from 1.9° to 3.4°, while Fan B flow angles range from 3.2° to 6.4°, and with both Fans A and B operating, the flow angles ranged from 2.7° to 3.1°. The completed data sheets from these tests are available in Appendix C, Subsection C.2.

Table 4.2. Summary of LV-C2 Retest Flow Angle Tests

Operating Fan	Flow Condition	Run No.	Approx. Air Velocity (afpm)	Flow Angle (Degrees)
A	Max	FA-1	3266	3.4
		FA-2	3253	2.7
		FA-3	3144	2.4
	Norm	FA-4	2797	2.4
		FA-5	2530	2.3
		FA-6	2496	2.3
	Min	FA-7	1647	1.9
B	Max	FA-8	3156	6.4
		FA-9	3177	4.6
	Norm	FA-10	2567	4.4
	Min	FA-11	1547	3.2
		FA-12	1586	5.5
		FA-13	1556	5.2
A&B	Max	FA-14	3041	3.4
	Min	FA-15	1582	2.7
		FA-16	1577	2.6
		FA-17	1569	3.1

Note: Individual and replicate sets of tests are alternately shaded and unshaded.

4.3 LV-C2 Retest Gaseous Tracer Uniformity

During the gas tracer testing, the responses of the gas analyzers were checked against calibration standards of appropriate concentrations, and the results met the requirements of the procedure. The data sheets from these calibration checks can be found in the first portion of Appendix C, Subsection C.3.

The LV-C2 scale model had six injection ports, however, only three were employed during testing. They are Injection Port 2 (I2), Injection Port 3 (I3), and Injection Port 4 (I4), as shown in Figure 2.2. All three injection ports are in circular sections of duct and the five injection points within the circular duct are shown in Figure 3.5.

Table 4.3 lists the results for all of the gaseous tracer uniformity tests performed on the scale model LV-C2 stack. No contingency sampling port was tested for this scale model; all tests were performed at the proposed test port location. Gas tracer test conditions for GT-1 through GT-4 were repeated at the end of the end of testing, as GT-32 through GT-35, because the calibration gas standard used to check the performance of the gas analyzer was past its expiration date and was discovered in an internal audit which generated a Non-Conformance Report (NCR-OTS-0787). These test results (GT-1 – GT-4) are not to be used. However, they are reported here for completeness and are considered For Information Only.

Gaseous uniformity tests using Fan A ranged from 0.3 to 2.6 %COV for gas injection at I4. Gas uniformity tests using Fan B ranged from 1.2 to 6.1 %COV with gas injection occurring at I3. Gas uniformity tests using both fans ranged from 1.9 to 11.9 %COV for gas injection at I2. In all cases, the gas tracer was well-mixed, with results well within the qualification criteria of %COV values less than or equal to 20% and absolute value of maximum deviation less than or equal to 30%. COV values were typically less than 10%, with maximum deviation values typically less than 20%. The completed data sheets are available in Appendix C, Subsection C.3.

Table 4.3. Summary of LV-C2 Retest Gas Tracer Uniformity Tests

Operating Fan	Flow Condition	Injection Port & Location	Run No.	Approx. Air Velocity (afpm)	%COV	Absolute % Max. Dev. from Mean
A	Min	I4, Center	GT-12	1616	0.3	0.5
		I4, Top	GT-13	1632	1.2	1.6
		I4, Bottom	GT-14	1611	0.6	1.4
		I4, Far Wall	GT-15	1612	2.6	6.8
		I4, Near Wall	GT-16	1663	1.4	2.9
		I4, Far Wall	GT-17	1602	2.1	4.4
		I4, Far Wall	GT-18	1596	1.5	2.7
	Norm	I4, Far Wall	GT-19	2617	1.9	3.5
		I4, Far Wall	GT-20	2652	1.9	3.7
	Max	I4, Far Wall	GT-21	3178	2.3	5.0
		I4, Far Wall	GT-22	3117	2.1	3.7
B	Max	~~I3, Center~~	~~GT-1~~	~~3191~~	~~4.1~~	~~7.2~~
		I3, Center	GT-32	3106	6.1	11.6
		~~I3, Far Wall~~	~~GT-2~~	~~3105~~	~~1.7~~	~~5.2~~
		I3, Far Wall	GT-33	3088	2.5	6.0
		~~I3, Near Wall~~	~~GT-3~~	~~3145~~	~~3.2~~	~~5.0~~
		I3, Near Wall	GT-34	3145	4.0	7.2
		I3, Top	GT-4	3116	2.1	3.8
		I3, Top	GT-35	3171	1.3	4.0
		I3, Bottom	GT-5	3066	1.2	3.0
		I3, Center	GT-6	3053	1.7	3.5
		I3, Center	GT-7	3109	1.8	3.4
	Norm	I3, Center	GT-8	2616	1.7	3.7
		I3, Center	GT-9	2651	2.1	4.9
	Min	I3, Center	GT-10	1608	2.6	4.7
		I3, Center	GT-11	1624	3.2	7.6
A&B	Min	I2, Center	GT-23	1637	10.5	27.6
		I2, Far Wall	GT-24	1609	9.4	19.4
		I2, Near Wall	GT-25	1639	11.9	27.4
		I2, Bottom	GT-26	1636	1.9	5.5
		I2, Top	GT-27	1648	8.3	16.3
		I2, Near Wall	GT-28	1589	9.4	18.7
		I2, Near Wall	GT-29	1604	9.8	21.2
	Max	I2, Near Wall	GT-30	3136	9.5	20.1
		I2, Near Wall	GT-31	3160	9.0	20.0

Note 1: Individual and replicate sets of tests are alternately shaded and unshaded.
Note 2: The test results GT-1to GT-4 are not to be used, but are reported here for completeness.

4.4 LV-C2 Particle Tracer Uniformity

Results of the particle tracer uniformity tests include the non-normalized %COV and normalized %COV for each run. The non-normalized %COV utilizes the particulate concentration data directly, while the normalized %COV results from a data adjustment that has been performed for this and previous tests based on previous test experience. Typically, a concentration bias is encountered between the two traverse directions because the probe orientation is vertical through the bottom port and horizontal through the side port. The bias is removed by adjusting the data from the traverse with the lower concentration upward by a factor to match the concentrations at the center of the duct (the common point between the two traverses). These results were then termed "normalized." In interpreting the table of particle tracer uniformity results, the normalized data are considered the pertinent result. The non-normalized data are used in comparison to the normalized result as an indication of the concentration bias.

In the original LV-C2 testing, conducted in 2014, the particle tracer uniformity test criteria were not met in the maximum flow condition. Those tests utilized not-to-scale backdraft dampers which were installed 90° offset compared with the actual system. After the original tests, BNI notified PNNL of reduced system flow rates. As part of the retest effort, a set of preliminary tests were performed to relate the original test results with the not-to-scale backdraft damper installed in correct orientation and to scaled control and backdraft dampers installed in proper orientation with the updated flow conditions. All preliminary tests were done in the same configuration that failed during initial testing, i.e., Fan B at maximum flow rate, and the results are shown in Table 4.4.

The results of these preliminary tests still indicated that even with the reduced flow conditions, the installation of the scaled dampers did not pass the test criterion with particle injection at Injection Port 2 (normalized %COV = 23.4).

A second set of preliminary tests was conducted to find a sampling port and injection port combination that would allow the system to pass. To simulate relocating the sampling location farther downstream on the stack, a five foot section of duct with new test ports was installed (see Figure 4.1). The new section was inserted between the section of duct with the Test Port 1 and the section of duct with the Reference Port. An Injection Port 5 was added upstream of the Fan B control damper. Because of the tight space the standard injection probe could not be used at I5, so two other injection probes were fabricated. Based on flow patterns the probe with the right angle was used to inject particles at I5 (see Figure 4.2). The aerosol from the probe with the 90° angle flowed more directly downstream as opposed to the probe with the 90° sweeping bend where the aerosol drifted out of the probe end at an obtuse angle.

Table 4.4. Summary of LV-C2 Retest Preliminary Particle Tracer Uniformity Tests Using Injection Port I2 and Test Port 1

Damper Configuration	Fan	Run Nos.	Approx. Air Velocity (afpm)	Non-Normalized % COV	Normalized % COV
Oversized, correct alignment	B Previous Max	PT-1	3958	29.9	21.5
		PT-2	3953	29.4	29.6
		PT-3	3984	23.5	23.5
	B Retest Max	PT-4	3262	33.5	33.5
		PT-5	3229	41.0	33.5
		PT-6	3319	16.6	16.0
Oversized 90° off alignment	B Previous Max	PT-7	3762	21.3	22.6
		PT-8	3859	22.5	23.4
		PT-9	3873	12.1	14.7
	B Retest Max	PT-10	3250	25.6	25.8
		PT-11	3172	20.0	19.3
		PT-12	3141	15.2	15.2
Scale	B Previous Max	PT-13	3161	54.6	17.5
		PT-14	3190	22.1	22.1
		PT-15	3173	24.7	24.7
	B Retest Max	PT-16	2746	23.4	23.4

Figure 4.1. Modified Section of Scale Model Stack with Additional Tests Ports at 1-ft Intervals

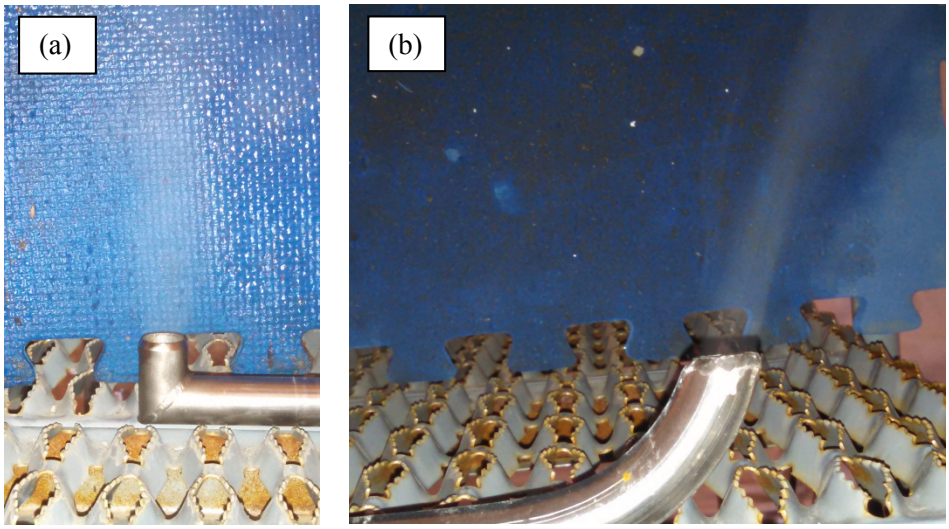


Figure 4.2. Injection Probes Fabricated to Accommodate Tight Space at Injection Port 5: a) 90° Angle and b) 90° Bend

Results of this second set of preliminary tests are shown in Table 4.5. With tests for each set of injection port / test port combination done in triplicate, it was clear that if the Injection Port was to remain at the I2 location, the Test Port would have to be relocated at least one duct diameter further downstream than the current location of Test Port 1. This situation was undesirable due to cost associated with modifying the existing stack to move the sampling port. Particle injection before the control damper (Injection Port 5) was the least preferred injection location regardless of where sampling was done.

Injection port 3 seemed to have mixed results, so another set of triplicate test were completed for all test port locations and on average, particle injection at I3 with sampling taking place at the preferred location (Test Port 1) appeared to be the best combination of injection and test ports. After this combination was identified for the Fan B maximum flow conditions it was determined that when a single fan was operating tracer injection would be performed on the individual fan leg (Injection Port 3 or 4). When both fans were operated at same time, particle injection would be done at Injection Port 2. Then the test matrix laid out in the Test Plan (TP-WTPSP-130 Rev. 1) was performed as the final tests. These results are shown in Table 4.6.

The results from the final particle uniformity tests using Fan A ranged from 2.50 to 8.86 %COV for particle injection at I4, while particle uniformity tests using Fan B ranged from 4.96 to 12.77 %COV with particle injection occurring at I3. Particle uniformity tests using both fans ranged from 4.96 to 11.16 %COV for particle injection at I2. In all cases, the particle tracer was well-mixed, with results well within the qualification criteria of %COV values less than or equal to 20%. COV values were typically less than 10%. The entire set of completed data sheets are available in Appendix C, Subsection C.4.

Table 4.5. Summary of LV-C2 Retest Preliminary Particle Tracer Uniformity Tests Investigating Injection Ports and Test Ports at Revised Maximum Flow Rates, with Fan B

Injection Port	Test Port[1]	Run Nos.	Approx. Air Velocity (afpm)	Non-Normalized % COV	Normalized % COV
I2	1D	PT-17	3007	12.5	11.1
		PT-18	3237	12.6	11.9
		PT-19	3093	19.9	19.3
	2D	PT-29	3080	18.4	17.4
		PT-30	3087	13.6	13.5
		PT-31	3104	12.5	12.4
I3	1	PT-20	3049	35.8	18.3
		PT-21	2929	16.0	15.1
		PT-22	2993	19.7	19.7
		PT-41	3086	18.5	7.1
		PT-42	3071	8.8	8.8
		PT-43	3074	22.7	10.2
	1D	PT-23	2978	21.4	22.0
		PT-24	3035	11.1	11.2
		PT-25	3100	13.4	14.0
		PT-38	3036	14.5	13.9
		PT-39	3061	14.4	14.1
		PT-40	3080	19.5	13.4
	2D	PT-26	3233	11.2	11.6
		PT-27	3177	13.2	13.9
		PT-28	3071	12.7	12.6
		PT-44	3087	16.1	16.5
		PT-45	3107	14.5	14.0
		PT-46	3035	21.0	17.1
I5	1	PT-32	3071	17.4	17.4
		PT-35	3134	13.5	13.3
		PT-37	3058	16.7	16.5
	1D	PT-33	3025	23.2	23.4
		PT-34	3161	21.0	21.2
		PT-36	3069	19.3	16.8

Note 1: D is used in Test Port column to indicate the location of the sampling port, i.e., either 1 or 2 Duct Diameter(s) Downstream of Test Port 1.

Table 4.6. Summary of Final LV-C2 Retest Particle Tracer Uniformity Tests

Operating Fan	Injection Port	Flow Condition	Run Nos.	Measured AFPM	Non-Normalized % COV	Normalized % COV
A	I4	Min	PT-53	1551	3.5	3.4
			PT-54	1522	8.9	2.5
			PT-55	1528	4.8	3.5
		Norm	PT-59	2621	6.7	6.1
			PT-60	2737	9.9	4.3
			PT-61	2676	5.9	6.8
		Max	PT-56	3141	8.3	7.4
			PT-57	3156	9.6	7.1
			PT-58	3100	11.0	8.9
B	I3	Min	PT-50	1477	9.5	5.0
			PT-51	1595	8.4	8.6
			PT-52	1625	10.1	9.4
		Norm	PT-47	2364	12.3	8.4
			PT-48	2595	11.5	11.0
			PT-49	2626	9.4	9.2
		Max	PT-41	3086	18.5	7.1
			PT-42	3071	8.8	8.8
			PT-43	3074	22.7	10.2
			PT-68	3041	7.9	7.5
			PT-69	3098	10.5	8.6
			PT-70	3153	12.9	12.8
			PT-71	3145	16.1	9.4
A&B	I2	Min	PT-65	1626	6.3	6.2
			PT-66	1643	9.9	5.0
			PT-67	1624	8.7	8.0
		Max	PT-62	3029	13.6	11.2
			PT-63	3050	13.9	9.6
			PT-64	3066	11.6	9.9

5.0 Conclusions

The results of the stack qualification tests performed with the LV-C2 scale model stack are summarized in Table 5.1. The criteria for sampling probe locations given in ANSI/HPS N13.1-1999, *Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stack and Ducts of Nuclear Facilities,* were met in all cases. These criteria address the capability of the sampling probe to extract a sample that represents the effluent stream. The range of results presented in Table 5.1 for the LV-C2 stack covers the designed location for the air sampling probe, Test Port 1.

Table 5.1. Summary of Sampling Probe Location Results for the LV-C2 Scale Model Stack

	Acceptance Criteria	Units	Original LV-C2	Final LV-C2
			Test Port 1	Test Port 1
Velocity Uniformity	≤20	%COV	2.2 – 5.4	2.1 – 5.1
Flow Angle	≤20	Degrees	2.9 – 8.0	1.9 – 5.5
Gas Tracer Uniformity	≤20	%COV	0.8 – 14.7	0.3 – 11.9
	≤30	Maximum % Deviation from Mean	1.3 – 18.6	0.5 – 27.6
Particle Tracer Uniformity	≤20	Normalized %COV	6.0 – 31.1	2.5 – 12.8

Note: The test failure in the original results was for the particle tracer uniformity tests when Fan B was operated at the maximum flow condition.

Based on these scale model tests, the location proposed for the air sampling probe in the LV-C2 stack meet the requirements of the ANSI/HPS N13.1-1999 standard. Additional velocity uniformity and flow angle tests on the actual stacks will be necessary during cold startup to confirm the validity of the scale model results in representing the actual stacks. In particular, the velocity uniformity test results for the actual stacks must be within 5 %COV of the range of results listed above for the scale model so that scale model results can be said to be representative of the stack. For example, if the actual LV-C2 stack sampling probe is located in a position corresponding to Test Port 1, the measured velocity uniformity %COV should be between 0.0 and 10.1 %COV (non-negative value for 2.1 - 5 = 0.0, and 5.1 + 5 = 10.1). The velocity uniformity test results summarized in Table 5.1 cover a range of flow conditions that are expected to bracket the conditions of the actual stack. For cold startup tests, the DV value and Reynolds number should meet the criteria listed in Section 1.1 (i.e., DV within a factor of six and Reynolds number >10,000). The velocity uniformity acceptance range would be constructed using the scale model results that correspond to the probe location and fan operating conditions present during the test on the actual stack.

If in-plant qualification testing becomes necessary, results comparable to this report are more likely when the tracer injection locations are comparable to those used for these tests. For the LV-C2 system either Injection Port I2 (when both fans are operating), I3 (only Fan B operating) or I4 (only Fan A operating) would be acceptable (see Figure 2.2).

6.0 References

10 CFR 830, Subpart A. "Quality Assurance Requirements." *Code of Federal Regulations*, U.S. Department of Energy.

40 CFR 60, Appendix A, Method 1. "Method 1—Sample and Velocity Traverses for Stationary Sources." *Code of Federal Regulations,* U.S. Environmental Protection Agency.

40 CFR 61, Subpart H. "National Emission Standard for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities." *Code of Federal Regulations,* U.S. Environmental Protection Agency.

ANSI/HPS N13.1-1999. *Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and ducts of Nuclear Facilities*. American National Standards Institute and the Health Physics Society, McLean, VA (reaffirmed in 2011 as ANSI/HPS N13.1-2011).

American Society of Mechanical Engineers (ASME). *Quality Assurance Requirements for Nuclear Facility Applications*. NQA-1-2000, New York, NY.

DOE Order 414.1D. "Quality Assurance." U.S. Department of Energy, Washington, D.C.

Appendix A

LV-C2 Scale Model Testing Supporting Documents List

Appendix A: Document List

Project Plan	PP-WTPSP-131 Rev 0.0	Air Sampling Probe Location Remedial Tests for Waste Treatment Plant LAW LV-C2 Air Exhaust System
Test Plan	TP-WTPSP-130 Rev 0.1	Air Sampling Probe Location Remedial Tests for Waste Treatment Plant LAW LV-C2 Air Exhaust System
Procedures	EMS-JAG-01	Test to Determine Uniformity of a Tracer Gas at a Sampler Probe
	EMS-JAG-02	Test to Determine Uniformity of a Tracer Aerosol at a Sampler Probe
	EMS-JAG-04	Test to Determine Uniformity of Gas Velocity at the Elevation of a Sampler Probe
	EMS-JAG-05	Test to Determine Flow Angle at the Elevation of a Sampler Probe
Test Instructions	TI-WTPSP-106	Measurements LV-C2 Scale Model
	TI-WTPSP-107	Calibration of Ventilation Flow Controller for LV-C2 Scale Model Stack
	TI-WTPSP-108	Velocity Uniformity Measurements of LV-C2 Scale Model
	TI-WTPSP-109	Determine Flow Angle in LV-C2 Scale Model Stack
	TI-WTPSP-110	Tests of Particle Tracer Mixing in LV-C2 Scale Model Stack
	TI-WTPSP-111	Tests of Gas Tracer Mixing in LV-C2 Scale Model Stack
	TI-WTPSP-124	Additional Test of Particle Tracer Mixing in LV-C2 Scale Model
	TI-WTPSP-135	Determine Flow Angle in LV-C2 Remedial Scale Model Stack
	TI-WTPSP-136	Velocity Uniformity Measurements of LV-C2 Remedial Scale Model
	TI-WTPSP-137	Tests of Gas Tracer Mixing in LV-S3 Remedial Scale Model Stack
	TI-WTPSP-138	Tests of Particle Tracer Mixing in LV-C2 Remedial Scale Model Stack
Calculation Packages	CCP-WTPSP-1315	Calibration of Ventilation Flow Controller for LV-C2 Scale Model
	CCP-WTPSP-1316	Determine Air Velocity Uniformity of LV-C2 Scale Model Stack
	CCP-WTPSP-1317	Determine Flow Angle in LV-C2 Scale Model Stack
	CCP-WTPSP-1318	Gas Tracer Mixing in Modified LV-C2 Scale Model Stack
	CCP-WTPSP-1319	Determine Particle Tracer Uniformity of LV-C2 Scale Model Stack
	CCP-WTPSP-1337	Determine Flow Angle in LV-C2 Remedial Scale Model Stack
	CCP-WTPSP-1338	Determine Air Velocity Uniformity of LV-C2 Remedial Scale Model Stack
	CCP-WTPSP-1339	Determine Particle Tracer Uniformity of LV-C2 Remedial Scale Model Stack
	CCP-WTPSP-1340	Gas Tracer Mixing in Modified LV-C2 Remedial Scale Model Stack
	CCP-WTPSP-1341	Determine Particle Tracer Uniformity for an Additional Test of Particle Tracer Mixing in LV-C2 Scale Model

Appendix B

LV-C2 Data Sheets

B.1 LV-C2 Summary Tables

Table B.1. Summary of LV-C2 Velocity Uniformity Tests

Operating Fan	Flow Condition	Run No.	Flow (acfm)	Approx. Air Velocity (afpm)	%COV	ABS Max Dev.
A	Max	VT-1	3022	3332	5.4	17.2
	Min	VT-5	1430	1863	2.8	33.0
		VT-7	1455	1877	3.7	34.0
		VT-8	1443	1862	3.7	38.3
B	Max	VT-2	2996	3898	4.1	19.9
		VT-3	2924	3864	3.8	21.3
		VT-4	2583	3771	2.2	92.7
	Min	VT-6	1288	1662	2.3	82.2
AB	Max	VT-9	1359	1754	2.9	29.6
	Min	VT-10	3858	3838	4.1	27.0

Table B.2. Summary of LV-C2 Flow Angle Tests

Operating Fan	Flow Condition	Run No.	Approx. Air Velocity (afpm)	Flow Angle (Degrees)
A	Max	FA-1	3804	4.1
		FA-2	3904	3.2
		FA-3	3707	3.7
	Min	FA-10	1850	2.9
B	Max	FA-4	3722	8.0
	Min	FA-5	1743	5.8
		FA-6	1772	6.1
		FA-7	1768	6.4
A & B	Max	FA-8	3873	8.0
	Min	FA-9	1706	3.1

Table B.3. Summary of LV-C2 Gas Tracer Uniformity Tests

Operating Fan	Flow Condition	Injection Port & Location	Run No.	Average Velocity (afpm)	%COV	Absolute % Max. Dev. from Mean
Fan A	Max	I2, Center	GT-11	3825	0.8	1.3
		I2, Near	GT-18	3871	3.6	7.7
		I2, Far	GT-21	3809	2.9	4.3
		I2, Top	GT-14	3850	2.4	4.8
		I2, Center	GT-12	3875	2.0	2.7
		I2, Bottom	GT-13	3965	2.9	6.3
	Min	I2, Near	GT-25	1803	5.3	13.2
Fan B	Max	I2, Center	GT-4	3918	14.7	18.6
		I2, Center	GT-5	3838	0.3	0.4
		I2, Center	GT-10	3838	3.0	9.1
		I2, Center	GT-22	3963	2.0	3.9
	Min	I2, Center	GT-1	1827	1.7	3.3
		I2, Near	GT-19	1873	6.1	11.5
		I2, Far	GT-20	1826	1.1	2.2
		I2, Top	GT-3	1805	5.2	13.6
		I2, Bottom	GT-2	1826	1.9	3.3
Fans A&B	Max	I2, Center	GT-6	3925	1.7	2.6
		I2, Center	GT-9	3965	10.7	23.7
		I2, Near	GT-17	4023	5.9	11.8
		I2, Far	GT-16	3931	8.9	15.2
		I2, Top	GT-15	3839	8.2	13.0
		I2, Bottom	GT-7	3835	1.3	1.4
		I2, Bottom	GT-8	3906	4.5	8.9
		I2, Far	GT-24	3859	4.4	9.7
	Min	I2, Center	GT-23	1815	7.8	12.9

Table B.4. Summary of LV-C2 Particle Tracer Uniformity Tests

Operating Fan	Flow Condition	Test Port	Injection Port	Run No.	Avg Velocity (afpm)	Normalized %COV	Absolute % Max. Dev. from Mean
Fan A	Max	1	I2	PT-1	3958	11.9	46.7
				PT-2	3948	11.9	46.6
				PT-3	3882	7.7	52.4
			I4	PT-15	3751	13.4	30.6
	Min	1	I2	PT-4	1853	2.4	20.3
Fan B	Max	1	I2	PT-5	3946	22.9	72.0
				PT-9	3871	31.1	87.7
				PT-26	3867	22.1	59.1
			I2, BDD 65^{o} Open	PT-29	3462	8.47	33.3
				PT-30	3826	19.7	61.0
				PT-31	3709	24.7	68.3
				PT-33	3600	17.5	49.1
				PT-34	3506	16.5	45.1
			I3	PT-14	3763	27.9	77.3
				PT-18	3820	14.1	60.2
				PT-24	3868	25.4	67.2
				PT-27	3638	23.5	50.7
				PT-28	3605	22.8	50.1
			I5	PT-33	3703	21.6	53.3
		Ref Port	I3	PT-19	3860	18.4	64.4
			I2	PT-20	3847	18.5	38.1
				PT-21	3844	14.4	42.9
		1D	I2	PT-25	3893	26.2	99.5
	Min	1	I2	PT-6	1811	13.3	29.5
				PT-7	1803	8.7	19.4
				PT-8	1798	14.8	41.0
Fans A&B	Max	1	I2	PT-10	3745	17.6	37.5
			I3	PT-17	3794	14.9	53.7
			I4	PT-16	3595	12.4	49.5
	Min	1	I2	PT-11	1734	12.8	31.6
				PT-12	1760	20.2	41.0
				PT-13	1831	19.7	32.5
				PT-23	1785	14.3	30.0
		Ref Port	I2	PT-22	1808	6.0	34.4

B.2 LV-C2 Calibration of Ventilation Flow Controller

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**FC-1**
Date	**4/22/13**	Fan Configuration	**Fan A**
Testers	EA, CA	Fan Setting	**30** **Hz**
Stack Dia.	11.922 in.	Stack Temp	57.2 deg F
Stack X-Area	111.6 in.2	Start/End Time	930/958
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	1194	1195	1312	1233.7	1242	1559	1541	1447.3
2	1.25	2026	2036	2032	2031.3	1900	1899	1854	1884.3
3	2.31	2098	2103	2112	2104.3	2024	2018	2022	2021.3
4	3.85	2125	2143	2157	2141.7	2060	2030	2065	2051.7
Center	5.96	2103	2088	2100	2097.0	2063	2078	2065	2068.7
5	8.07	2066	2048	2044	2052.7	2077	2074	2099	2083.3
6	9.61	2029	2037	2029	2031.7	2059	2061	2095	2071.7
7	10.67	1991	1999	1986	1992.0	2090	2072	2057	2073.0
8	11.42	1929	1933	1953	1938.3	1935	1984	2077	1998.7
Averages ---------->		1951.2	1953.6	1969.4	1958.1	1938.9	1975.0	1986.1	1966.7

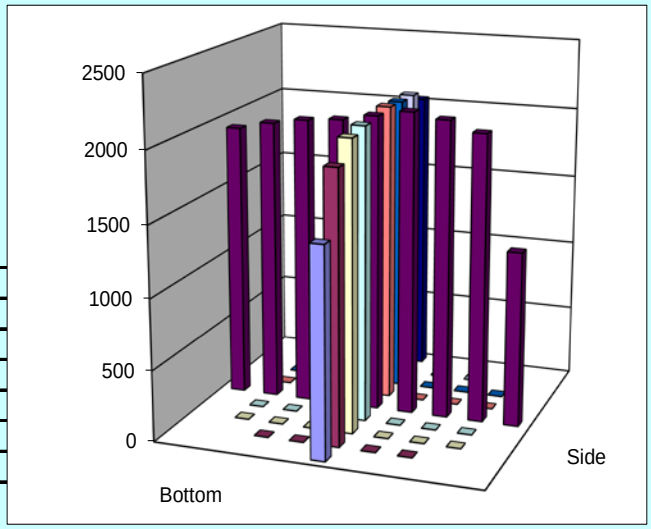
All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	1962.4		Mean	2064.4	2036.3	2050.3
Min Point	1233.7	-37.1%	Std. Dev.	51.9	70.0	61.0
Max Point	2141.7	9.1%	COV as %	2.5	3.4	**3.0**

Flow w/o C-Pt	1510	acfm	
Vel Avg w/o C-Pt	1947	afpm	

Instuments Used:

		Cal Due
TSI VelociCalc	T95351203001	12/10/13
Fisher Scientific Barometer	90936818	12/11/2013

	Start	Finish	
Stack temp	57.4	57	F
Equipment temp	NA	NA	F
Ambient temp	55.4	57.2	F
Stack static	NA	NA	mbars
Ambient pressure	30.09	30.09	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	32%	29%	RH



Notes:

CA 4/22/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	EG
Signature/date	4/22/2013	Signature/date	6/11/2013
		Signature on file with original TI-WTPSP-107	

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**FC-2**
Date	**4/22/13**	Fan Configuration	**Fan B**
Testers	EA, CA	Fan Setting	**30** **Hz**
Stack Dia.	11.922 in.	Stack Temp	59.2 deg F
Stack X-Area	111.6 in.2	Start/End Time	1000/1025
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	1431	1562	1472	1488.3	1769	1836	1907	1837.3
2	1.25	2092	2076	2039	2069.0	2131	2123	2124	2126.0
3	2.31	2061	2078	2093	2077.3	2123	2104	2089	2105.3
4	3.85	1998	1998	2038	2011.3	2055	2029	2033	2039.0
Center	5.96	2015	2005	2012	2010.7	2034	2011	2002	2015.7
5	8.07	2026	2033	2040	2033.0	2041	1983	2011	2011.7
6	9.61	2127	2091	2111	2109.7	2017	1984	1994	1998.3
7	10.67	2194	2196	2190	2193.3	1961	1934	1970	1955.0
8	11.42	2165	2207	2188	2186.7	1927	1886	1919	1910.7
Averages ---------->		2012.1	2027.3	2020.3	2019.9	2006.4	1987.8	2005.4	1999.9

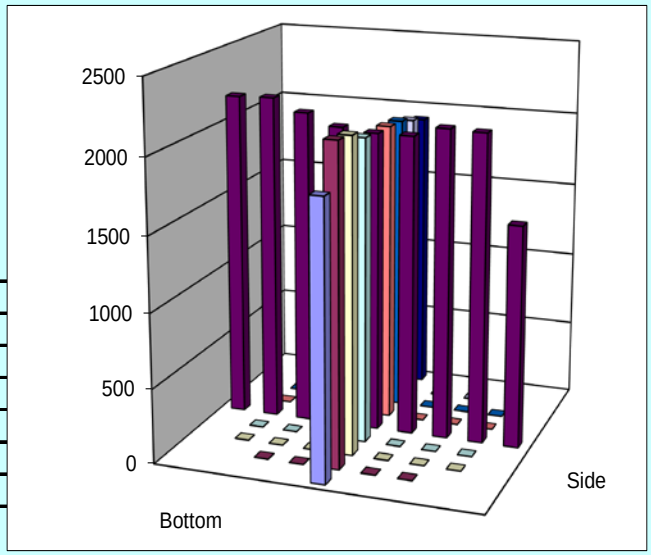
All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	2009.9		Mean	2072.0	2035.9	2054.0
Min Point	1488.3	-26.0%	Std. Dev.	64.7	60.4	63.0
Max Point	2193.3	9.1%	COV as %	3.1	3.0	**3.1**

Flow w/o C-Pt	1558	acfm	
Vel Avg w/o C-Pt	2010	afpm	

Instuments Used:

		Cal Due
TSI VelociCalc	T95351203001	12/10/13
Fisher Scientific Barometer	90936818	12/11/2013

	Start	Finish	
Stack temp	59	59.4	F
Equipment temp	NA	NA	F
Ambient temp	57.2	56.3	F
Stack static	NA	NA	mbars
Ambient pressure	30.09	30.06	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	28%	29%	RH



Notes:

CA 4/22/13

Entries made by:	Carmen Arimescu
Signature/date	4/22/2013

Technical Data Review performed by:	EG
Signature/date	6/3/2013
Signature on file with original TI-WTPSP-107	

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**FC-3**
Date	**4/22/13**	Fan Configuration	**FAN AB**
Testers	EA, CA	Fan Setting	**30** **Hz**
Stack Dia.	11.922 in.	Stack Temp	59.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	1030/1045
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	1628	2205	1757	1863.3	2096	2204	2321	2207.0
2	1.25	3007	2981	3019	3002.3	2984	2955	2945	2961.3
3	2.31	3128	3146	3106	3126.7	3183	3135	3101	3139.7
4	3.85	3157	3185	3140	3160.7	3215	3181	3126	3174.0
Center	5.96	3037	3090	3058	3061.7	3085	3069	3031	3061.7
5	8.07	2989	3018	2997	3001.3	3013	3018	2965	2998.7
6	9.61	2940	2959	2933	2944.0	2992	2993	2968	2984.3
7	10.67	2822	2868	2808	2832.7	2961	2927	2932	2940.0
8	11.42	2702	2803	2728	2744.3	2892	2836	2882	2870.0
Averages ---------->		2823.3	2917.2	2838.4	2859.7	2935.7	2924.2	2919.0	2926.3

All	ft/min	Dev. from mean
Mean	2893.0	
Min Point	1863.3	-35.6%
Max Point	3174.0	9.7%

Center 2/3	Side	Bottom	All
Mean	3018.5	3037.1	3027.8
Std. Dev.	111.4	90.6	98.0
COV as %	3.7	3.0	**3.2**

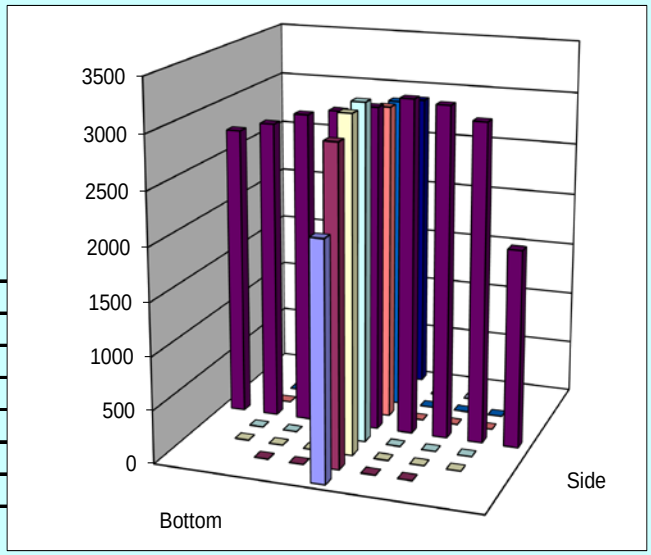
Flow w/o C-Pt 2226 acfm

Vel Avg w/o C-Pt 2872 afpm

Instuments Used:

		Cal Due
TSI VelociCalc	T95351203001	12/10/13
Fisher Scientific Barometer	90936818	12/11/2013

	Start	Finish	
Stack temp	59	60	F
Equipment temp	NA	NA	F
Ambient temp	55.4	57.2	F
Stack static	NA	NA	mbars
Ambient pressure	30.06	30.06	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	28%	26%	RH



Notes:

CA 4/22/13

Entries made by:	Carmen Arimescu
Signature/date	4/22/2013

Technical Data Review performed by:	EG
Signature/date	6/3/2013
Signature on file with original TI-WTPSP-107	

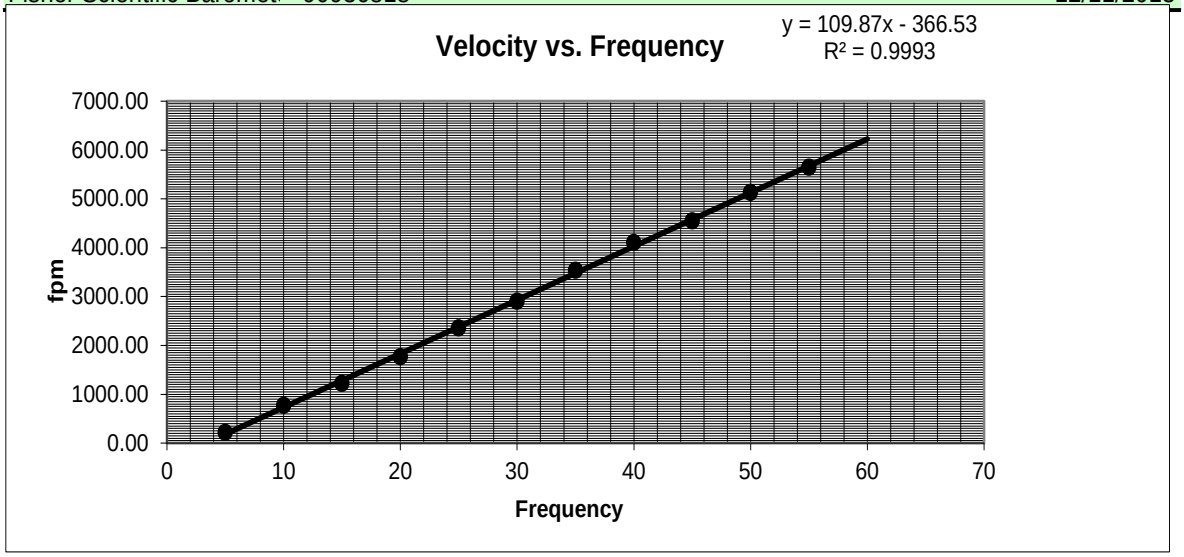
VELOCITY vs. FREQUENCY DATA FORM

Site	**LV-C2 model**	Run No.	**VF-1**
Date	4/22/2013	Stack Temp	66.5
Tester	EA, CA	Stack RH%	NA
Stack Dia.	11.922 in.	Baro Press	30.12
Stack X-Area	111.6 in2	Fan Configuration	Fan AB
Test Port	1	Start/End Time	114/200
Dist. from disturbance	119.88 inches	Reference point from velocity test VC :	Bottom 8
Velocity Readings, units =	afpm		

Target acfm	Target afpm	Estmtd Hz
2566	3921	39
1885	2880	29.5
1212	1853	20

	afpm						
Hz	1	2	3	Mean	StDev	2 StDev	cfm
5	124	248	288	220.00	85.51	171.02	170.55
10	782	769	758	769.67	12.01	24.03	596.66
15	1230	1198	1246	1224.67	24.44	48.88	949.39
20	1750	1800	1752	1767.33	28.31	56.62	1370.07
25	2390	2328	2359	2359.00	31.00	62.00	1828.75
30	2987	2968	2768	2907.67	121.33	242.65	2254.08
35	3735	3376	3497	3536.00	182.65	365.30	2741.18
40	4214	4118	3992	4108.00	111.34	222.67	3184.61
45	4641	4479	4535	4551.67	82.28	164.55	3528.55
50	5119	5190	5094	5134.33	49.80	99.61	3980.24
55	5802	5486	5649	5645.67	158.03	316.05	4376.64
60	over range	over range	over range				

Instuments Used:		**Cal Exp. Date:**
TSI VelociCalc	T95351203001	12/10/2013
Fisher Scientific Baromet	90936818	12/11/2013



Entries made by:	Carmen Arimescu	Technical Data Review performed by:	EG
Signature/date	4/22/2013	Signature/date	6/11/2013
		Signature on file with original TI_WTPSP-107	

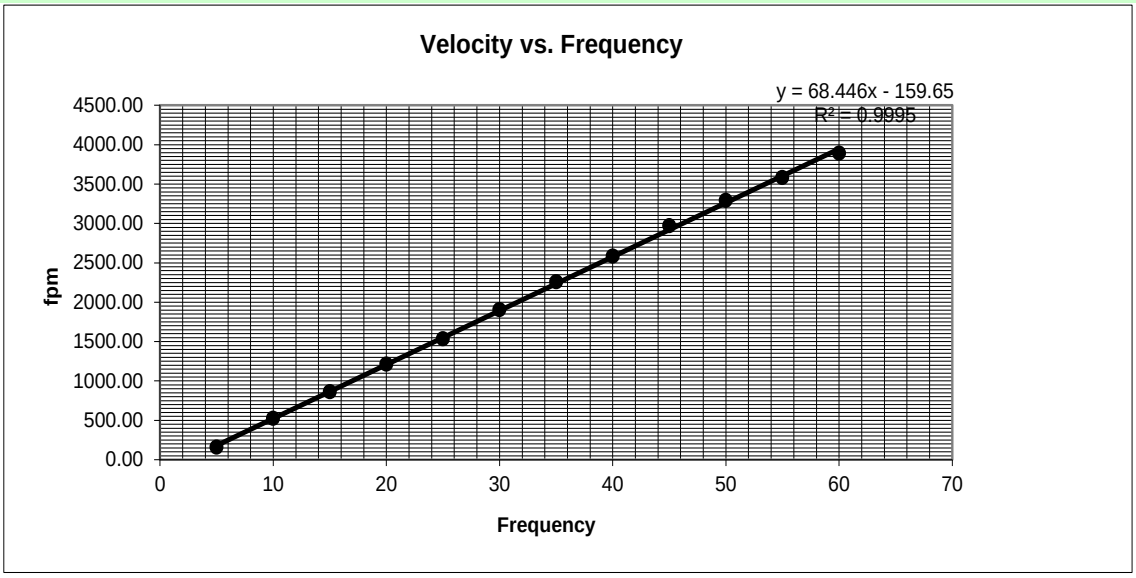
VELOCITY vs. FREQUENCY DATA FORM

Site	**LV-C2 model**	Run No.	**VF-2**
Date	4/22/2013	Stack Temp	69
Tester	EA, CA	Stack RH%	NA
Stack Dia.	11.922 in.	Baro Press	30.12
Stack X-Area	111.6 in2	Fan Configuration	Fan A
Test Port	1	Start/End Time	205/223
Dist. from disturbance	119.88 inches	Reference point from velocity test VC :	Side 8
Velocity Readings, units =	afpm		

Target acfm	Target afpm	Estmtd Hz
2566	3921	59.6
1885	2880	45.5
1212	1853	30.1

	afpm						
Hz	1	2	3	Mean	StDev	2 StDev	cfm
5	205	122	145	157.33	42.85	85.70	121.97
10	530	504	543	525.67	19.86	39.72	407.51
15	873	844	875	864.00	17.35	34.70	669.79
20	1219	1215	1204	1212.67	7.77	15.53	940.08
25	1533	1534	1542	1536.33	4.93	9.87	1191.00
30	1924	1878	1907	1903.00	23.26	46.52	1475.25
35	2291	2230	2252	2257.67	30.89	61.78	1750.19
40	2596	2560	2593	2583.00	19.97	39.95	2002.40
45	2971	2966	2981	2972.67	7.64	15.28	2304.47
50	3337	3268	3269	3291.33	39.55	79.10	2551.51
55	3597	3571	3579	3582.33	13.32	26.63	2777.10
60	3852	3945	3879	3892.00	47.84	95.69	3017.16

Instuments Used:		**Cal Exp. Date:**
TSI VelociCalc	T95351203001	12/10/2013
Fisher Scientific Baromet	90936818	12/11/2013



Entries made by:	Carmen Arimescu	Technical Data Review performed by:	EG
Signature/date	4/22/2013	Signature/date	6/3/2013
		Signature on file with original TI_WTPSP-107	

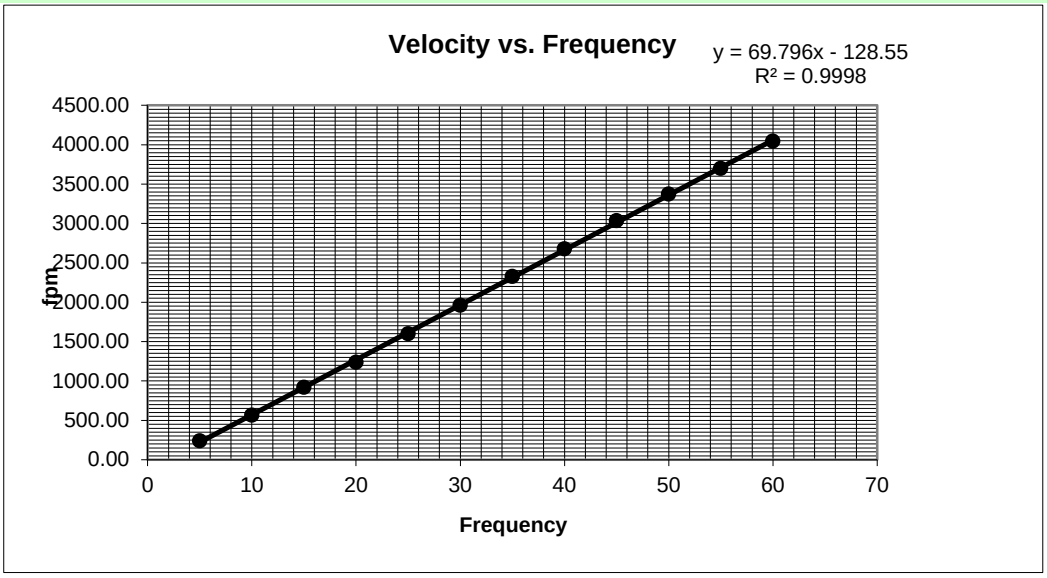
VELOCITY vs. FREQUENCY DATA FORM

Site	**LV-C2 model**	Run No.	**VF-3**
Date	4/22/2013	Stack Temp	73
Tester	EA, CA	Stack RH%	NA
Stack Dia.	11.922 in.	Baro Press	30.15
Stack X-Area	111.6 in2	Fan Configuration	Fan B
Test Port	1	Start/End Time	230/330
Dist. from disturbance	119.88 inches	Reference point from velocity test VC :	Side Center
Velocity Readings, units =	afpm		

	Target acfm	Target afpm	Estmtd Hz	
	2566	3921	58	max
	1885	2880	43.1	normal
	1212	1853	28.4	min

	afpm						
Hz	1	2	3	Mean	StDev	2 StDev	cfm
5	235	255	231	240.33	12.86	25.72	186.31
10	577	554	565	565.33	11.50	23.01	438.26
15	930	908	921	919.67	11.06	22.12	712.95
20	1265	1232	1220	1239.00	23.30	46.60	960.50
25	1629	1583	1583	1598.33	26.56	53.12	1239.06
30	1977	1930	1971	1959.33	25.58	51.16	1518.92
35	2349	2318	2318	2328.33	17.90	35.80	1804.97
40	2719	2650	2657	2675.33	37.98	75.96	2073.98
45	3088	3022	2998	3036.00	46.60	93.21	2353.57
50	3410	3339	3365	3371.33	35.92	71.84	2613.53
55	3738	3646	3714	3699.33	47.72	95.44	2867.80
60	4082	4046	4008	4045.33	37.00	74.01	3136.03

Instuments Used:		**Cal Exp. Date:**
TSI VelociCalc	T95351203001	12/10/2013
Fisher Scientific Barom	90936818	12/11/2013



Entries made by:	Carmen Arimescu	Technical Data Review performed by:	EG
Signature/date	4/22/2013	Signature/date	6/3/2013
		Signature on file with original TI_WTPSP-107	

B.3 LV-C2 Velocity Uniformity Data Sheets

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**VT-1**
Date	**4/23/13**	Fan Configuration	**Fan B**
Testers	EA, CA	Fan Setting	**58** **Hz**
Stack Dia.	11.922 in.	Stack Temp	57 deg F
Stack X-Area	111.6 in.2	Start/End Time	900/930
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	s ft/min	Data Files:	NA

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	3055	3258	3342	3218.3	3313	3440	3700	3484.3
2	1.25	3892	3879	3838	3869.7	3938	3959	3923	3940.0
3	2.31	3873	3866	3830	3856.3	3911	3865	3901	3892.3
4	3.85	3722	3726	3705	3717.7	3770	3756	3778	3768.0
Center	5.96	3765	3788	3791	3781.3	3831	3952	3732	3838.3
5	8.07	3941	3987	3975	3967.7	3751	3931	3827	3836.3
6	9.61	4137	4149	4126	4137.3	3748	4046	3811	3868.3
7	10.67	4216	4212	4264	4230.7	4128	4254	4197	4193.0
8	11.42	4193	4217	4130	4180.0	4310	4249	4073	4210.7
Averages ---------->		3866.0	3898.0	3889.0	3884.3	3855.6	3939.1	3882.4	3892.4

All	s ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	3888.4		Mean	3937.2	3905.2	3921.2
Min Point	3218.3	-17.2%	Std. Dev.	187.4	137.6	158.8
Max Point	4230.7	8.8%	COV as %	4.8	3.5	**4.1**

Flow w/o C-Pt 3022 acfm

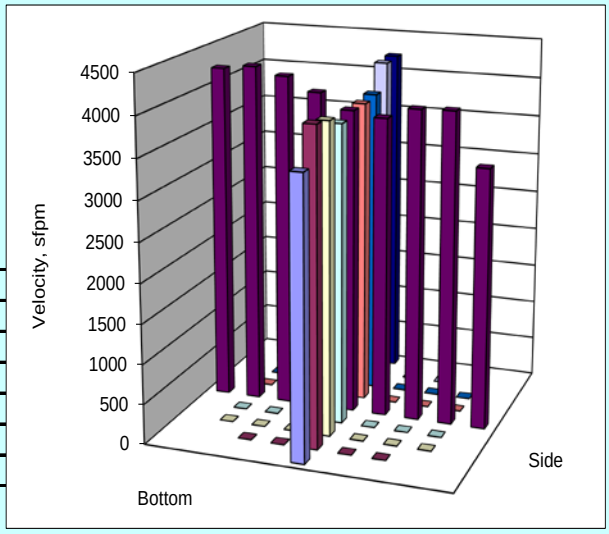
Vel Avg w/o C-Pt 3898 afpm

Instuments Used: Cal Due

Fishcer Scientific Barometer SN 90936818 12/11/13

TSI VelociCalc SN T95351203001 12/10/2013

	Start	Finish	
Stack temp	56	58.6	F
Equipment temp	NA	NA	F
Ambient temp	57.2	58.1	F
Stack static	NA	NA	mbars
Ambient pressure	30.50	30.50	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	27%	26%	RH



Notes:

CA 4/23/2013

Entries made by:	Carmen Arimescu
Signature/date	4/23/2013

Technical Data Review performed by: Elizabeth Golovich

Signature/date 6/3/2013

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VELOCITY TRAVERSE DATA FORM

Site	LV-C2 Model	Run No.	VT-2
Date	4/23/13	Fan Configuration	Fan B
Testers	EA, CA	Fan Setting	58 Hz
Stack Dia.	11.922 in.	Stack Temp	59.7 deg F
Stack X-Area	111.6 in.2	Start/End Time	930/1000
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	ft/min	Data Files:	NA

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	3075	3007	3174	3085.3	3690	3650	3673	3671.0
2	1.25	3834	3795	3806	3811.7	3966	3897	3894	3919.0
3	2.31	3779	3755	3773	3769.0	3908	3872	3842	3874.0
4	3.85	3693	3679	3685	3685.7	3766	3743	3769	3759.3
Center	5.96	3772	3677	3675	3708.0	3805	3717	3942	3821.3
5	8.07	3889	3818	3807	3838.0	3878	3884	3953	3905.0
6	9.61	4016	3961	3912	3963.0	4110	3930	4233	4091.0
7	10.67	4096	4050	4024	4056.7	4206	4116	4234	4185.3
8	11.42	4078	4057	3937	4024.0	4240	4152	4179	4190.3
Averages ---------->		3803.6	3755.4	3754.8	3771.3	3952.1	3884.6	3968.8	3935.1

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	3853.2		Mean	3833.1	3936.4	3884.8
Min Point	3085.3	-19.9%	Std. Dev.	134.7	150.4	147.2
Max Point	4190.3	8.7%	COV as %	3.5	3.8	**3.8**

Flow w/o C-Pt 2996 acfm

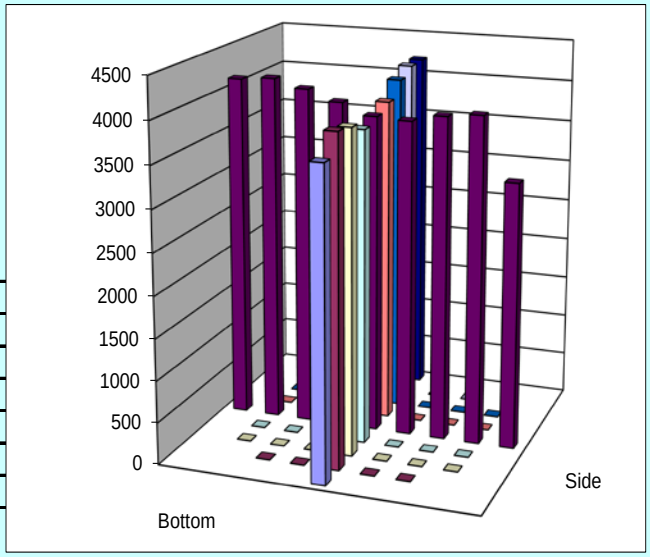
Vel Avg w/o C-Pt 3864 fpm

Instuments Used: Cal Due

Fishcer Scientific Barometer SN 90936818 12/11/13

TSI VelociCalc SN T95351203001 12/10/2013

	Start	Finish	
Stack temp	58.7	60.7	F
Equipment temp	NA	NA	F
Ambient temp	58.1	59	F
Stack static	NA	NA	mbars
Ambient pressure	30.50	30.50	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	26%	26%	RH



Notes:

CA 4/23/2013

Entries made by:	Carmen Arimescu
Signature/date	4/23/2013

Technical Data Review performed by: Elizabeth Golovich

Signature/date 6/3/2013

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VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**VT-3**
Date	**4/23/13**	Fan Configuration	**Fan B**
Testers	EA, CA	Fan Setting	**58** **Hz**
Stack Dia.	11.922 in.	Stack Temp	61.1 deg F
Stack X-Area	111.6 in.2	Start/End Time	1001/1026
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	ft/min	Data Files:	NA

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	3104	2893	2873	2956.7	3550	3570	3590	3570.0
2	1.25	3804	3818	3825	3815.7	3942	3887	3989	3939.3
3	2.31	3811	3808	3826	3815.0	3943	3869	3988	3933.3
4	3.85	3741	3748	3736	3741.7	3857	3774	3767	3799.3
Center	5.96	3727	3721	3710	3719.3	3820	3941	3720	3827.0
5	8.07	3824	3785	3801	3803.3	3736	3878	3690	3768.0
6	9.61	3903	3869	3892	3888.0	3709	3708	3705	3707.3
7	10.67	3989	3975	3983	3982.3	3737	3746	3901	3794.7
8	11.42	3969	3949	3948	3955.3	3910	3861	3844	3871.7
Averages ---------->		3763.6	3729.6	3732.7	3741.9	3800.4	3803.8	3799.3	3801.2

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	3771.6		Mean	3823.6	3824.1	3823.9
Min Point	2956.7	-21.6%	Std. Dev.	89.0	85.1	83.6
Max Point	3982.3	5.6%	COV as %	2.3	2.2	**2.2**

Flow w/o C-Pt 2924 acfm

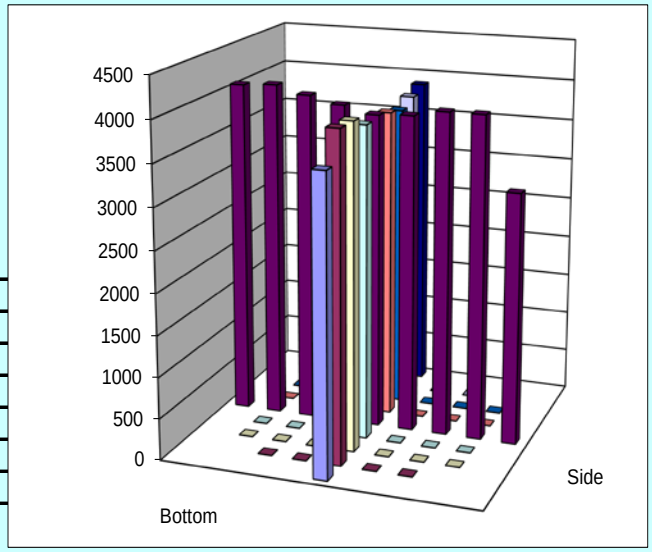
Vel Avg w/o C-Pt 3771 fpm

Instuments Used: Cal Due

Fishcer Scientific Barometer SN 90936818 12/11/13

TSI VelociCalc SN T95351203001 12/10/2013

	Start	Finish	
Stack temp	60.3	61.9	F
Equipment temp	NA	NA	F
Ambient temp	59	61.7	F
Stack static	NA	NA	mbars
Ambient pressure	30.50	30.50	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	26%	25%	RH



Notes:

CA 4/23/2013

Entries made by:	Carmen Arimescu
Signature/date	4/23/2013

Technical Data Review performed by: Elizabeth Golovich

Signature/date 6/3/2013

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VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**VT-4**
Date	**4/23/13**	Fan Configuration	**Fan A**
Testers	EA, CA	Fan Setting	**60** **Hz**
Stack Dia.	11.922 in.	Stack Temp	64.1 deg F
Stack X-Area	111.6 in.2	Start/End Time	1028/1050
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	ft/min	Data Files:	NA

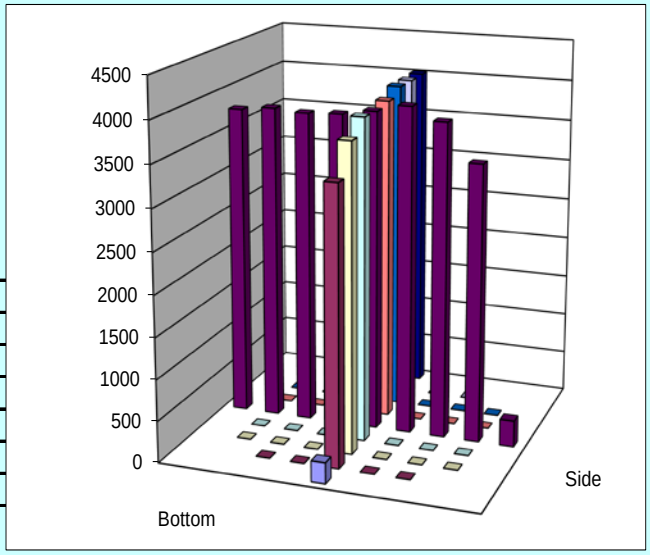
Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	320	330	306	318.7	241	246	252	246.3
2	1.25	3377	3373	3326	3358.7	3347	3198	3300	3281.7
3	2.31	3829	3810	3803	3814.0	3676	3623	3640	3646.3
4	3.85	3986	3977	3942	3968.3	3839	3791	3844	3824.7
Center	5.96	3874	3882	3877	3877.7	3794	3800	3823	3805.7
5	8.07	3799	3811	3827	3812.3	3844	3840	3843	3842.3
6	9.61	3796	3788	3792	3792.0	4026	3868	3913	3935.7
7	10.67	3842	3801	3823	3822.0	3891	3963	3937	3930.3
8	11.42	3806	3755	3770	3777.0	4007	3890	3906	3934.3
Averages ---------->		3403.2	3391.9	3385.1	3393.4	3407.2	3357.7	3384.2	3383.0

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	3388.2		Mean	3777.9	3752.4	3765.1
Min Point	246.3	-92.7%	Std. Dev.	194.3	228.9	204.4
Max Point	3968.3	17.1%	COV as %	5.1	6.1	**5.4**

Flow w/o C-Pt	2583	acfm
Vel Avg w/o C-Pt	3332	fpm

Instuments Used:	Cal Due
Fishcer Scientific Barometer SN 90936818	12/11/13
TSI VelociCalc SN T95351203001	12/10/2013

	Start	Finish	
Stack temp	62.8	65.3	F
Equipment temp	NA	NA	F
Ambient temp	62.6	63.5	F
Stack static	NA	NA	mbars
Ambient pressure	30.50	30.50	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	25%	25%	RH



Notes:

CA 4/23/2013

Entries made by:	Carmen Arimescu
Signature/date	4/23/2013

Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/3/2013
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VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**VT-5**
Date	**4/23/13**	Fan Configuration	**Fan A**
Testers	EA, CA	Fan Setting	**30.1** **Hz**
Stack Dia.	11.922 in.	Stack Temp	65.6 deg F
Stack X-Area	111.6 in.2	Start/End Time	1051/1113
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	ft/min	Data Files:	NA

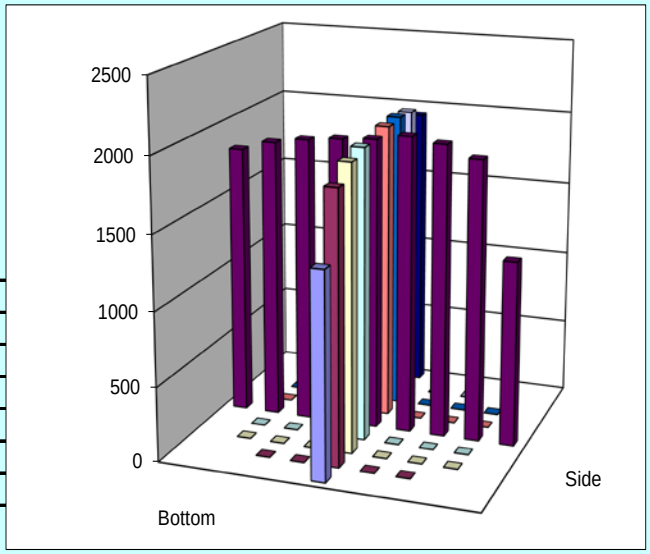
Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	1192	1342	1196	1243.3	1268	1427	1361	1352.0
2	1.25	1901	1901	1884	1895.3	1800	1786	1787	1791.0
3	2.31	1954	1976	1992	1974.0	1890	1887	1907	1894.7
4	3.85	1992	2005	2021	2006.0	1957	1935	1911	1934.3
Center	5.96	1956	1976	1974	1968.7	1938	1932	1934	1934.7
5	8.07	1955	1954	1947	1952.0	1954	1997	1954	1968.3
6	9.61	1923	1933	1930	1928.7	1965	2028	1953	1982.0
7	10.67	1897	1897	1880	1891.3	1964	2012	1932	1969.3
8	11.42	1846	1823	1807	1825.3	1906	1919	1875	1900.0
Averages ---------->		1846.2	1867.4	1847.9	1853.9	1849.1	1880.3	1846.0	1858.5

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	1856.2		Mean	1945.1	1924.9	1935.0
Min Point	1243.3	-33.0%	Std. Dev.	42.4	66.0	54.3
Max Point	2006.0	8.1%	COV as %	2.2	3.4	**2.8**

Flow w/o C-Pt	1430	acfm
Vel Avg w/o C-Pt	1844	fpm

	Start	Finish	
Stack temp	65.4	65.7	F
Equipment temp	NA	NA	F
Ambient temp	64.4	66.2	F
Stack static	NA	NA	mbars
Ambient pressure	30.50	30.50	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	25%	24%	RH

Instuments Used:	Cal Due
Fishcer Scientific Barometer SN 90936818	12/11/13
TSI VelociCalc SN T95351203001	12/10/2013



Notes:

CA 4/23/2013

Entries made by:	Carmen Arimescu
Signature/date	4/23/2013

Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/11/2013
Signature on file with original TI-WTPSP-108	

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**VT-6**
Date	**4/23/13**	Fan Configuration	**Fan B**
Testers	EA, CA	Fan Setting	**28.4** **Hz**
Stack Dia.	11.922 in.	Stack Temp	66.6 deg F
Stack X-Area	111.6 in.2	Start/End Time	1117/1139
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	ft/min	Data Files:	NA

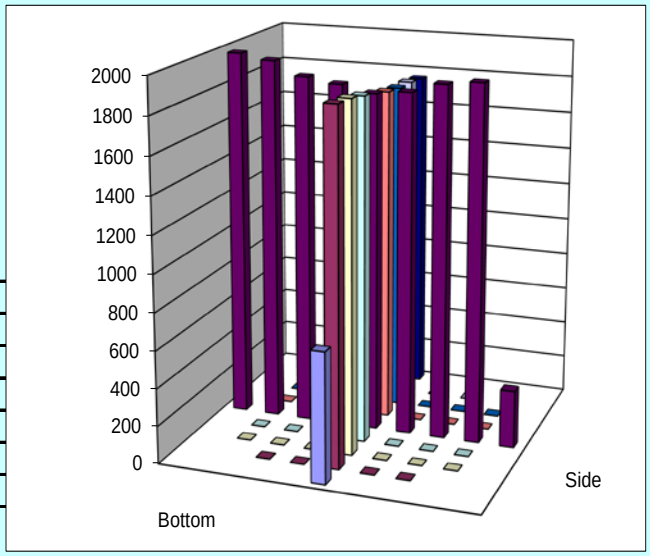
Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	303	347	247	299.0	667	727	676	690.0
2	1.25	1864	1858	1853	1858.3	1910	1855	1858	1874.3
3	2.31	1818	1842	1853	1837.7	1864	1850	1880	1864.7
4	3.85	1794	1788	1773	1785.0	1853	1807	1863	1841.0
Center	5.96	1775	1761	1762	1766.0	1805	1788	1854	1815.7
5	8.07	1787	1809	1806	1800.7	1778	1775	1815	1789.3
6	9.61	1788	1837	1857	1827.3	1767	1763	1791	1773.7
7	10.67	1896	1903	1896	1898.3	1773	1757	1781	1770.3
8	11.42	1922	1925	1929	1925.3	1747	1745	1774	1755.3
Averages ---------->		1660.8	1674.4	1664.0	1666.4	1684.9	1674.1	1699.1	1686.0

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	1676.2		Mean	1824.8	1818.4	1821.6
Min Point	299.0	-82.2%	Std. Dev.	45.3	42.7	42.4
Max Point	1925.3	14.9%	COV as %	2.5	2.3	**2.3**

Flow w/o C-Pt	1288	acfm
Vel Avg w/o C-Pt	1662	fpm

Instuments Used:	Cal Due
Fishcer Scientific Barometer SN 90936818	12/11/13
TSI VelociCalc SN T95351203001	12/10/2013

	Start	Finish	
Stack temp	67	66.1	F
Equipment temp	NA	NA	F
Ambient temp	68	68	F
Stack static	NA	NA	mbars
Ambient pressure	30.50	30.50	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	24%	24%	RH



Notes:

CA 4/23/2013

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	4/23/2013	Signature/date	6/3/2013
		Signature on file with original TI-WTPSP-108	

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**VT-7**
Date	**4/23/13**	Fan Configuration	**Fan A**
Testers	EA, CA	Fan Setting	**30.1** **Hz**
Stack Dia.	11.922 in.	Stack Temp	68.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	1141/1209
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	ft/min	Data Files:	NA

Order -->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	Velocity				Velocity			
1 / 0.50	1155	1185	1397	1245.7	1443	1344	1381	1389.3
2 / 1.25	1900	1919	1892	1903.7	1770	1804	1744	1772.7
3 / 2.31	2130	1985	2015	2043.3	1927	1916	1913	1918.7
4 / 3.85	2021	2018	2014	2017.7	1931	1976	2004	1970.3
Center / 5.96	1992	1960	1971	1974.3	1919	1958	1972	1949.7
5 / 8.07	1950	1940	1932	1940.7	1995	1959	2035	1996.3
6 / 9.61	1960	1936	1962	1952.7	2005	2002	2073	2026.7
7 / 10.67	1944	1944	1954	1947.3	2019	2124	2049	2064.0
8 / 11.42	1888	1888	1868	1881.3	1959	2008	1939	1968.7
Averages ---------->	1882.2	1863.9	1889.4	1878.5	1885.3	1899.0	1901.1	1895.1

All	ft/min	Dev. from mean
Mean	1886.8	
Min Point	1245.7	-34.0%
Max Point	2064.0	9.4%

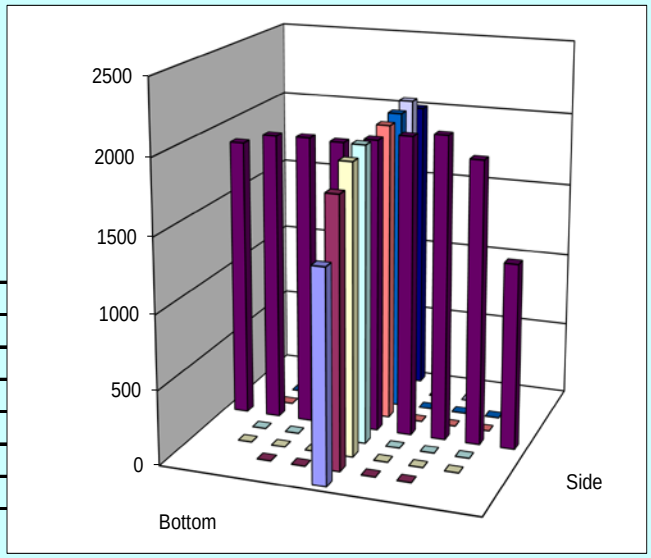
Center 2/3	Side	Bottom	All
Mean	1968.5	1956.9	1962.7
Std. Dev.	47.8	94.5	72.2
COV as %	2.4	4.8	**3.7**

Flow w/o C-Pt	1455	acfm
Vel Avg w/o C-Pt	1877	fpm

Instuments Used:

	Cal Due
Fishcer Scientific Barometer SN 90936818	12/11/13
TSI VelociCalc SN T95351203001	12/10/2013

	Start	Finish	
Stack temp	68	69	F
Equipment temp	NA	NA	F
Ambient temp	68.9	74.3	F
Stack static	NA	NA	mbars
Ambient pressure	30.50	30.50	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	24%	22%	RH



Notes:

CA 4/23/2013

Entries made by:	Carmen Arimescu
Signature/date	4/23/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 6/3/2013
Signature on file with original TI-WTPSP-108

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**VT-8**
Date	**4/23/13**	Fan Configuration	**Fan A**
Testers	EA, CA	Fan Setting	**30.1** **Hz**
Stack Dia.	11.922 in.	Stack Temp	68.8 deg F
Stack X-Area	111.6 in.2	Start/End Time	1212/1239
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	ft/min	Data Files:	NA

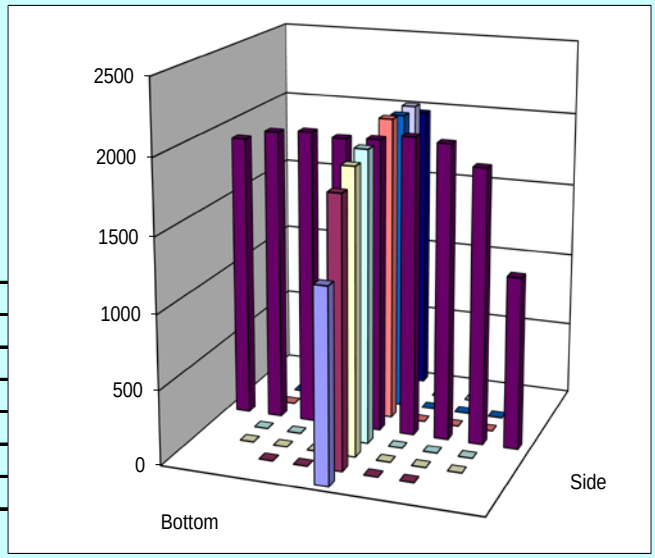
Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	1089	1171	1211	1157.0	1176	1307	1348	1277.0
2	1.25	1852	1870	1833	1851.7	1773	1787	1791	1783.7
3	2.31	1993	1993	1978	1988.0	1874	1917	1896	1895.7
4	3.85	2021	2019	1998	2012.7	1931	1936	1980	1949.0
Center	5.96	1987	1969	1975	1977.0	1950	1940	1985	1958.3
5	8.07	1968	1973	1958	1966.3	2187	1970	1975	2044.0
6	9.61	2006	1988	1981	1991.7	2021	2065	1974	2020.0
7	10.67	1962	1961	1995	1972.7	2057	2040	2006	2034.3
8	11.42	1910	1915	1896	1907.0	1969	1932	1924	1941.7
Averages ---------->		1865.3	1873.2	1869.4	1869.3	1882.0	1877.1	1875.4	1878.2

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	1873.8		Mean	1965.7	1955.0	1960.4
Min Point	1157.0	-38.3%	Std. Dev.	52.5	92.5	72.5
Max Point	2044.0	9.1%	COV as %	2.7	4.7	**3.7**

Flow w/o C-Pt	1443	acfm	
Vel Avg w/o C-Pt	1862	fpm	

Instuments Used:	Cal Due
Fishcer Scientific Barometer SN 90936818	12/11/13
TSI VelociCalc SN T95351203001	12/10/2013

	Start	Finish	
Stack temp	69	68.5	F
Equipment temp	NA	NA	F
Ambient temp	77	77.9	F
Stack static	NA	NA	mbars
Ambient pressure	30.50	30.45	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	21%	21%	RH



Notes:

CA 4/23/2013

Entries made by:	Carmen Arimescu	Technical Data Review performed by: Elizabeth Golovich	
Signature/date	4/23/2013	Signature/date	6/3/2013
		Signature on file with original TI-WTPSP-108	

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**VT-9**
Date	**4/23/13**	Fan Configuration	**Fan A&B**
Testers	EA, CA	Fan Setting	**20.2** **Hz**
Stack Dia.	11.922 in.	Stack Temp	68.0 deg F
Stack X-Area	111.6 in.2	Start/End Time	1245/122
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	ft/min	Data Files:	NA

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	1431	1148	1153	1244.0	1231	1278	1270	1259.7
2	1.25	1804	1784	1770	1786.0	1769	1799	1787	1785.0
3	2.31	1917	1902	1885	1901.3	1918	1908	1933	1919.7
4	3.85	1915	1895	1902	1904.0	1895	1901	1915	1903.7
Center	5.96	1866	1841	1874	1860.3	1886	1872	1846	1868.0
5	8.07	1879	1837	1866	1860.7	1785	1837	1861	1827.7
6	9.61	1860	1854	1843	1852.3	1779	1789	1797	1788.3
7	10.67	1810	1822	1787	1806.3	1759	1751	1749	1753.0
8	11.42	1690	1729	1723	1714.0	1775	1706	1770	1750.3
Averages ---------->		1796.9	1756.9	1755.9	1769.9	1755.2	1760.1	1769.8	1761.7

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	1765.8		Mean	1853.0	1835.0	1844.0
Min Point	1244.0	-29.6%	Std. Dev.	44.2	63.8	53.5
Max Point	1919.7	8.7%	COV as %	2.4	3.5	**2.9**

Flow w/o C-Pt 1359 acfm

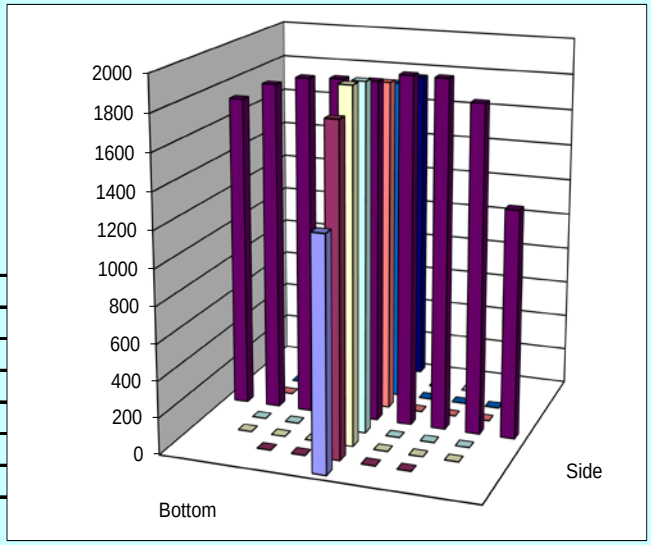
Vel Avg w/o C-Pt 1754 fpm

Instuments Used: Cal Due

Fishcer Scientific Barometer SN 90936818 12/11/13

TSI VelociCalc SN T95351203001 12/10/2013

	Start	Finish	
Stack temp	68	68	F
Equipment temp	NA	NA	F
Ambient temp	78	77.9	F
Stack static	NA	NA	mbars
Ambient pressure	30.45	30.45	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	21%	21%	RH



Notes:

CA 4/23/2013

Entries made by:	Carmen Arimescu
Signature/date	4/23/2013

Technical Data Review performed by: Elizabeth Golovich

Signature/date 6/11/2013

Signature on file with original TI-WTPSP-108

VELOCITY TRAVERSE DATA FORM

Site	LV-C2 Model	Run No.	VT-10
Date	4/23/13	Fan Configuration	Fan A&B
Testers	EA, CA	Fan Setting	39 Hz
Stack Dia.	11.922 in.	Stack Temp	66.8 deg F
Stack X-Area	111.6 in.2	Start/End Time	126/200
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	ft/min	Data Files:	NA

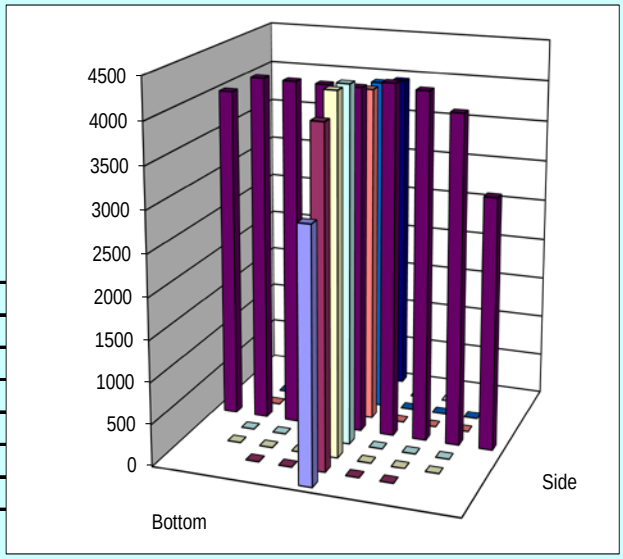
Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	2821	2907	2716	2814.7	2800	3081	3141	3007.3
2	1.25	3677	3694	3700	3690.3	4053	4014	4024	4030.3
3	2.31	3920	3894	3883	3899.0	4329	4287	4257	4291.0
4	3.85	3962	3946	3950	3952.7	4281	4272	4297	4283.3
Center	5.96	3863	3897	3879	3879.7	4173	4168	4144	4161.7
5	8.07	3854	3912	3885	3883.7	4046	4086	4050	4060.7
6	9.61	3883	3915	3881	3893.0	4036	4079	4063	4059.3
7	10.67	3875	3928	3904	3902.3	3937	3985	4021	3981.0
8	11.42	3711	3729	3741	3727.0	3939	3933	3909	3927.0
Averages ---------->		3729.6	3758.0	3726.6	3738.0	3954.9	3989.4	3989.6	3978.0

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	3858.0		Mean	3871.5	4123.9	3997.7
Min Point	2814.7	-27.0%	Std. Dev.	83.5	123.9	165.7
Max Point	4291.0	11.2%	COV as %	2.2	3.0	**4.1**

Flow w/o C-Pt	2975	acfm
Vel Avg w/o C-Pt	3838	fpm

Instuments Used:	Cal Due
Fishcer Scientific Barometer SN 90936818	12/07/12
TSI VelociCalc SN T95351203001	12/17/2012

	Start	Finish	
Stack temp	67	66.5	F
Equipment temp	NA	NA	F
Ambient temp	76.1	77	F
Stack static	NA	NA	mbars
Ambient pressure	30.45	30.45	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	21%	21%	RH



Notes:

CA 4/23/2013

Entries made by:	Carmen Arimescu
Signature/date	4/23/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 6/3/2013
Signature on file with original TI-WTPSP-108

B.4 LV-C2 Flow Angle Data Sheets

FLOW ANGLE DATA FORM

Site	**LV-C2 Scale Model**	Run No.	**FA-1**
Date	4/24/2013	Fan Setting	**60** Hz
Tester	EA, CA	Fan configuration	**Fan A**
Stack Dia.	11.922 in	Approx. air vel.	3804 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	57.1
Start/End Time	900/945		

Order -->		2nd				1st			
Traverse-->		**Side**				**Bottom**			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	-10	-11	-13	-11.3	-10	-11	-10	-10.3
2	1.25	1	2	3	2.0	6	6	4	5.3
3	2.31	-1	0	0	-0.3	4	5	2	3.7
4	3.85	-6	-3	-2	-3.7	0	0	1	0.3
Center	5.96	-8	-7	-9	-8.0	-2	-4	-2	-2.7
5	8.07	-4	-5	-6	-5.0	1	0	1	0.7
6	9.61	-1	-1	0	-0.7	3	3	1	2.3
7	10.67	3	5	1	3.0	4	4	2	3.3
8	11.42	3	7	4	4.7	6	3	3	4.0
Mean of absolute values:					4.3				3.6
" " w/o points by wall:					3.2				2.6

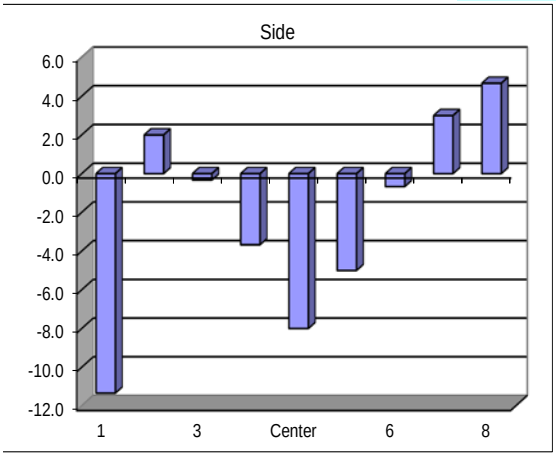
Grand mean ABS	4.0
" " w/o wall pts	2.9

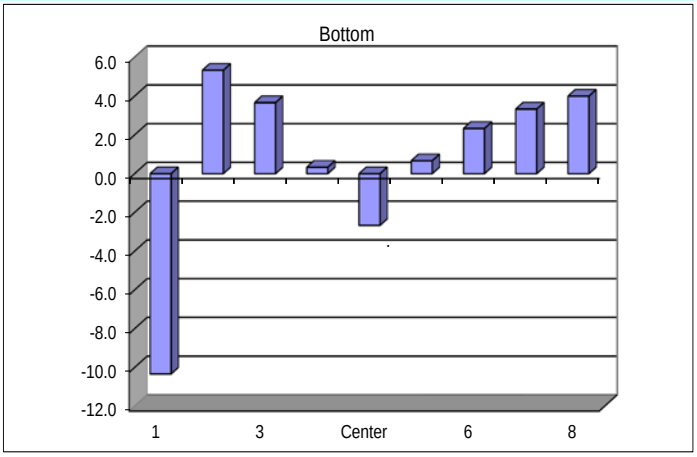
Instuments Used:		**Cal. Due**
S-type pitot	Dwyer 24-inch S-type Pitot#10	Cert. of conformance
Velocity sensor	TSI Velocicalc SN#T95351203001	10-Dec-13
Angle indicator	Shop built	Cat. 3
Manometer	Dwyer 400-5, S36N	Cat. 3

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA 4/24/13





Entries made by:	Carmen Arimescu
Signature/date	4/24/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/3/2013
Signature on file with original TI-WTPSP-109	

FLOW ANGLE DATA FORM

Site	LV-C2 Scale Model	Run No.	FA-2
Date	4/24/2013	Fan Setting	60 Hz
Tester	EA, CA	Fan configuration	Fan A
Stack Dia.	11.922 in	Approx. air vel.	3901 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	59.8
Start/End Time	951/1010		

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	-10	-10	-9	-9.7	-8	-9	-12	-9.7
2	1.25	6	2	2	3.3	4	3	3	3.3
3	2.31	2	1	0	1.0	1	-1	2	0.7
4	3.85	-1	-3	-5	-3.0	0	0	-3	-1.0
Center	5.96	-6	-8	-8	-7.3	-4	-3	-5	-4.0
5	8.07	-6	-2	-6	-4.7	-1	0	-3	-1.3
6	9.61	-2	-1	-4	-2.3	1	2	0	1.0
7	10.67	1	-1	-1	-0.3	2	3	1	2.0
8	11.42	0	1	1	0.7	1	3	1	1.7
Mean of absolute values:					3.6				2.7
" " w/o points by wall:					3.1				1.9

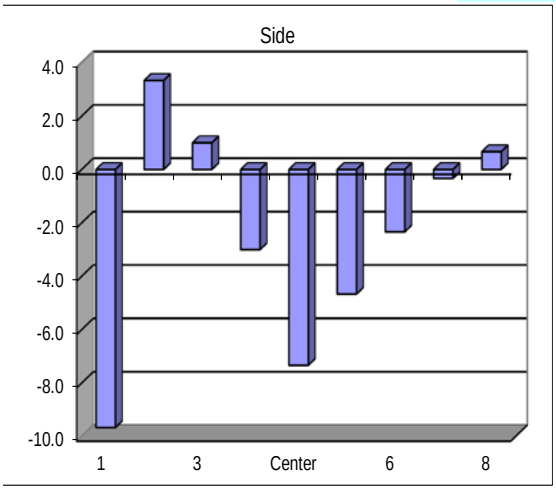
Grand mean ABS	3.2
" " w/o wall pts	2.5

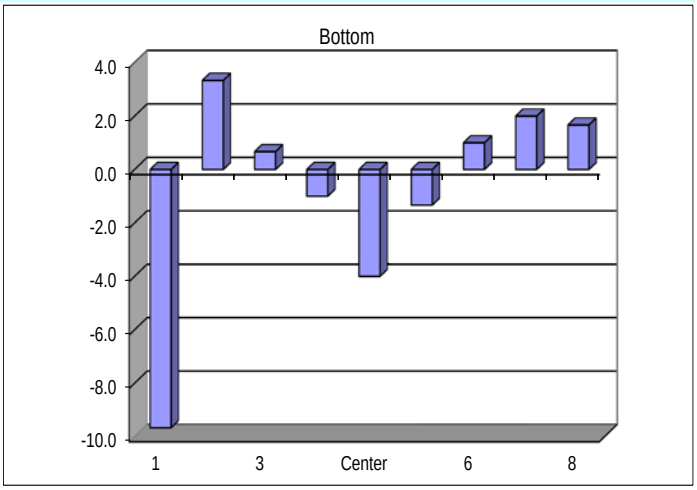
Instuments Used:		Cal. Due
S-type pitot	Dwyer 24-inch S-type Pitot#10	Cert. of conformance
Velocity sensor	TSI Velocicalc SN#T95351203001	10-Dec-13
Angle indicator	Shop built	Cat. 3
Manometer	Dwyer 400-5, S36N	Cat. 3

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA 4/24/13





Entries made by:	Carmen Arimescu
Signature/date	4/24/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/3/2013
Signature on file with original TI-WTPSP-109	

FLOW ANGLE DATA FORM

Site	LV-C2 Scale Model	Run No.	FA-3
Date	4/24/2013	Fan Setting	60 Hz
Tester	EA, Ca	Fan configuration	Fan A
Stack Dia.	11.922 in	Approx. air vel.	3706 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	63
Start/End Time	1017/1040		

Order -->	2nd				1st			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	-10	-9	-8	-9.0	-10	-10	-10	-10.0
2	1.25	1	2	2	1.7	3	2	4	3.0
3	2.31	1	2	3	2.0	2	2	5	3.0
4	3.85	-3	0	-4	-2.3	-1	-1	-2	-1.3
Center	5.96	-7	-7	-7	-7.0	-2	-5	-7	-4.7
5	8.07	-5	-4	-4	-4.3	-3	-4	-4	-3.7
6	9.61	0	-1	0	-0.3	0	1	1	0.7
7	10.67	3	1	1	1.7	3	4	2	3.0
8	11.42	4	5	5	4.7	3	5	3	3.7
Mean of absolute values:					3.7				3.7
" " w/o points by wall:					2.8				2.8

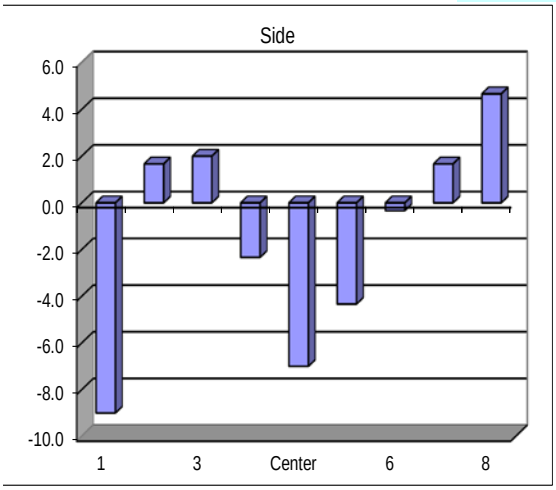
Grand mean ABS	3.7
" " w/o wall pts	2.8

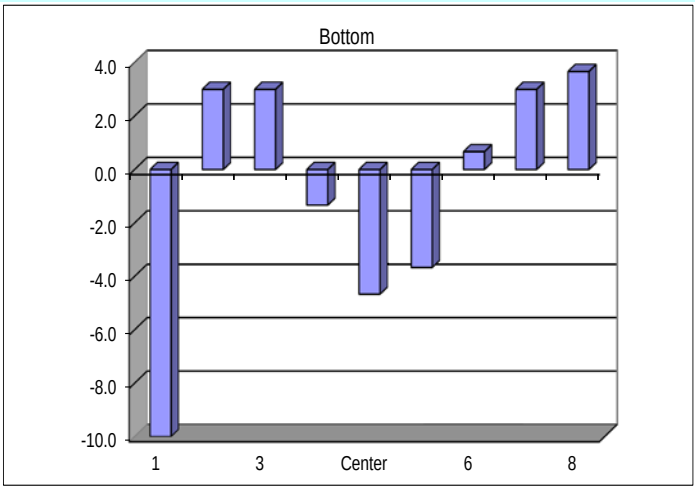
Instuments Used:		Cal. Due
S-type pitot	Dwyer 24-inch S-type Pitot#10	Cert. of conformance
Velocity sensor	TSI Velocicalc SN#T95351203001	10-Dec-13
Angle indicator	Shop built	Cat. 3
Manometer	Dwyer 400-5, S36N	Cat. 3

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA 4/24/13





Entries made by:	Carmen Arimescu
Signature/date	4/24/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/3/2013
Signature on file with original TI-WTPSP-109	

FLOW ANGLE DATA FORM

Site	LV-C2 Scale Model	Run No.	FA-4
Date	4/24/2013	Fan Setting	58 Hz
Tester	EA, CA	Fan configuration	Fan B
Stack Dia.	11.922 in	Approx. air vel.	3722 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	66
Start/End Time	1050/1122		

Order -->	1st				2nd				
Traverse-->	Side				Bottom				
Trial ---->	1	2	3		1	2	3		
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	-26	-26	-25	-25.7	-25	-24	-24	-24.3
2	1.25	-8	-8	-7	-7.7	-5	-4	-4	-4.3
3	2.31	-8	-10	-9	-9.0	-5	-7	-6	-6.0
4	3.85	-12	-10	-11	-11.0	-9	-12	-12	-11.0
Center	5.96	-5	-4	-4	-4.3	-8	-6	-10	-8.0
5	8.07	0	0	1	0.3	-5	-2	-3	-3.3
6	9.61	5	3	3	3.7	-1	-1	1	-0.3
7	10.67	5	6	5	5.3	4	4	5	4.3
8	11.42	5	6	5	5.3	10	11	8	9.7
Mean of absolute values:					8.0				7.9
" " w/o points by wall:					5.9				5.3

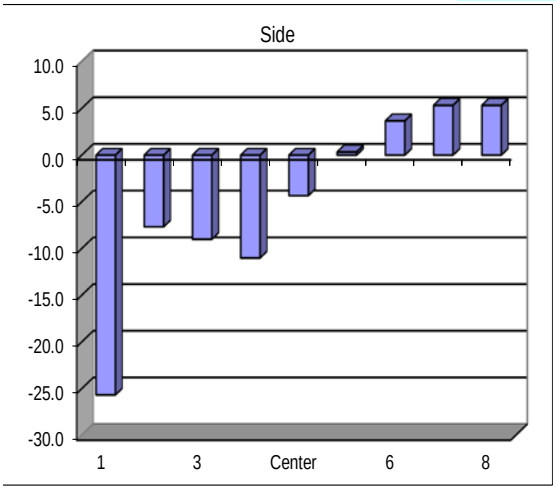
Grand mean ABS	8.0
" " w/o wall pts	5.6

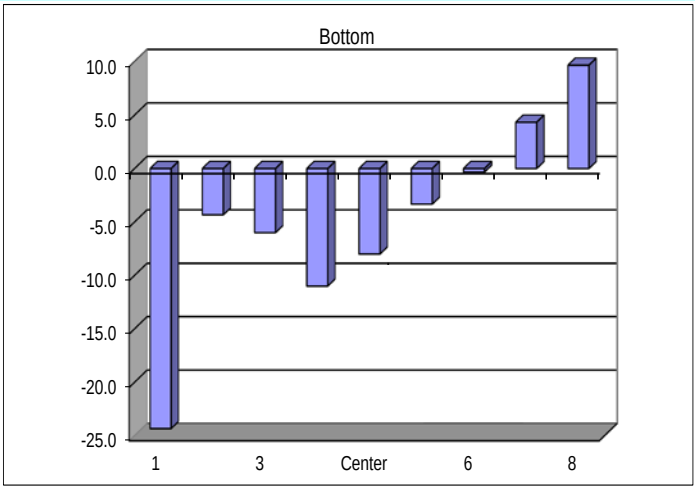
Instuments Used:		Cal. Due
S-type pitot	Dwyer 24-inch S-type Pitot#10	Cert. of conformance
Velocity sensor	TSI Velocicalc SN#T95351203001	10-Dec-13
Angle indicator	Shop built	Cat. 3
Manometer	Dwyer 400-5, S36N	Cat. 3

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA 4/24/13





Entries made by:	Carmen Arimescu
Signature/date	4/24/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/3/2013
Signature on file with original TI-WTPSP-109	

FLOW ANGLE DATA FORM

Site	LV-C2 Scale Model	Run No.	FA-5
Date	4/24/2013	Fan Setting	28 Hz
Tester	EA, CA	Fan configuration	Fan B
Stack Dia.	11.922 in	Approx. air vel.	1743 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	76.9
Start/End Time	112/142		

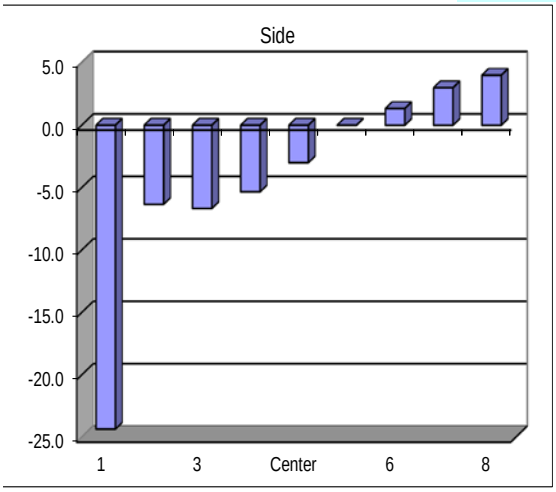
Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	-22	-25	-26	-24.3	-16	-15	-22	-17.7
2	1.25	-5	-7	-7	-6.3	-2	-3	-3	-2.7
3	2.31	-6	-6	-8	-6.7	-4	-4	-5	-4.3
4	3.85	-5	-5	-6	-5.3	-4	-5	-5	-4.7
Center	5.96	-3	-3	-3	-3.0	-6	-4	-6	-5.3
5	8.07	2	-1	-1	0.0	1	-1	-1	-0.3
6	9.61	2	1	1	1.3	4	1	1	2.0
7	10.67	5	2	2	3.0	6	4	5	5.0
8	11.42	6	5	1	4.0	9	7	10	8.7
Mean of absolute values:					6.0				5.6
" " w/o points by wall:					3.7				3.5
								Grand mean ABS	5.8
								" " w/o wall pts	3.6

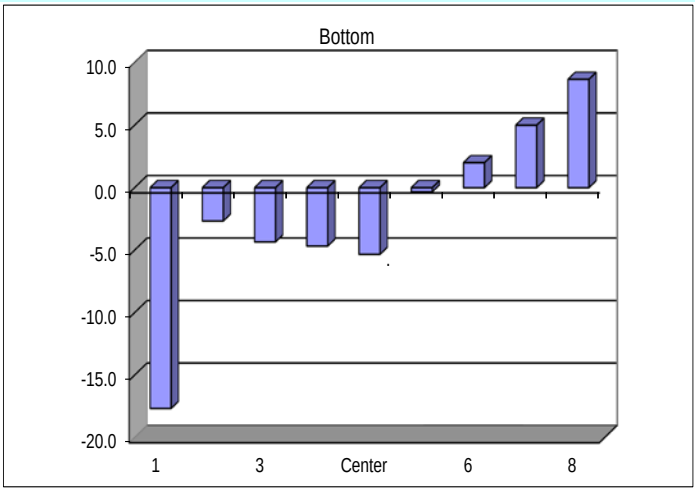
Instuments Used:		Cal. Due
S-type pitot	Dwyer 24-inch S-type Pitot#10	Cert. of conformance
Velocity sensor	TSI Velocicalc SN#T95351203001	10-Dec-13
Angle indicator	Shop built	Cat. 3
Manometer	Dwyer 400-5, S36N	Cat. 3

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA 4/24/13





Entries made by:	Carmen Arimescu
Signature/date	4/24/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/3/2013
Signature on file with original TI-WTPSP-109	

FLOW ANGLE DATA FORM

Site	LV-C2 Scale Model	Run No.	FA-6
Date	4/24/2013	Fan Setting	28 Hz
Tester	EA, CA	Fan configuration	Fan B
Stack Dia.	11.922 in	Approx. air vel.	1772 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	76
Start/End Time	145/201		

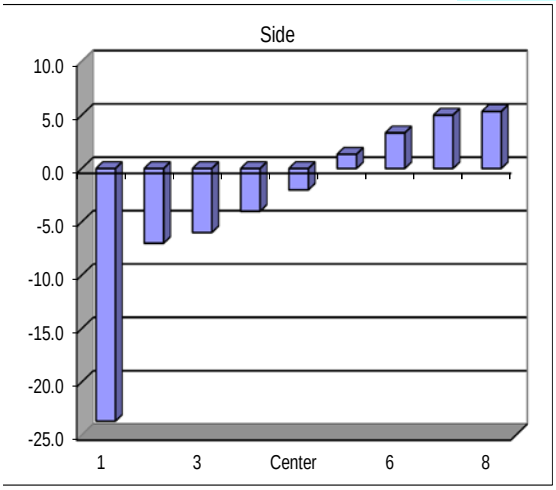
Order -->	1st				2nd				
Traverse-->		Side				Bottom			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	-22	-24	-25	-23.7	-15	-20	-20	-18.3
2	1.25	-7	-7	-7	-7.0	-1	-2	-4	-2.3
3	2.31	-6	-6	-6	-6.0	-3	-2	-4	-3.0
4	3.85	-4	-3	-5	-4.0	-3	-4	-6	-4.3
Center	5.96	-3	-2	-1	-2.0	-2	-3	-6	-3.7
5	8.07	1	1	2	1.3	-2	0	-2	-1.3
6	9.61	3	4	3	3.3	5	4	4	4.3
7	10.67	4	6	5	5.0	7	7	6	6.7
8	11.42	6	6	4	5.3	8	9	10	9.0
Mean of absolute values:					6.4				5.9
" " w/o points by wall:					4.1				3.7
								Grand mean ABS	6.1
								" " w/o wall pts	3.9

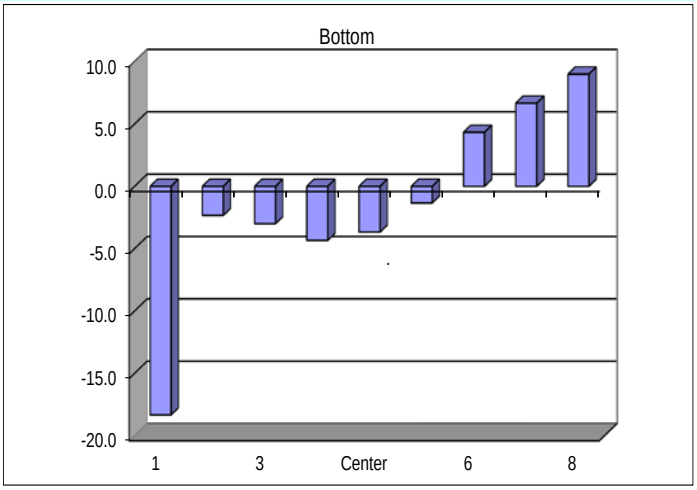
Instuments Used:		Cal. Due
S-type pitot	Dwyer 24-inch S-type Pitot#10	Cert. of conformance
Velocity sensor	TSI Velocicalc SN#T95351203001	10-Dec-13
Angle indicator	Shop built	Cat. 3
Manometer	Dwyer 400-5, S36N	Cat. 3

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA 4/24/13





Entries made by:	Carmen Arimescu
Signature/date	4/24/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/3/2013
Signature on file with original TI-WTPSP-109	

FLOW ANGLE DATA FORM

Site	LV-C2 Scale Model	Run No.	FA-7
Date	4/24/2013	Fan Setting	28 Hz
Tester	EA, CA	Fan configuration	Fan B
Stack Dia.	11.922 in	Approx. air vel.	1768 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	76
Start/End Time	1403/1500		

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	-24	-20	-25	-23.0	-20	-20	-20	-20.0
2	1.25	-5	-6	-7	-6.0	-3	-3	-2	-2.7
3	2.31	-7	-7	-7	-7.0	-5	-4	-4	-4.3
4	3.85	-5	-6	-7	-6.0	-6	-6	-4	-5.3
Center	5.96	-5	-1	-6	-4.0	-7	-5	-4	-5.3
5	8.07	-2	0	1	-0.3	0	0	0	0.0
6	9.61	1	2	4	2.3	3	3	4	3.3
7	10.67	2	2	4	2.7	6	6	9	7.0
8	11.42	5	5	5	5.0	9	10	11	10.0
Mean of absolute values:					6.3				6.4
" " w/o points by wall:					4.0				4.0

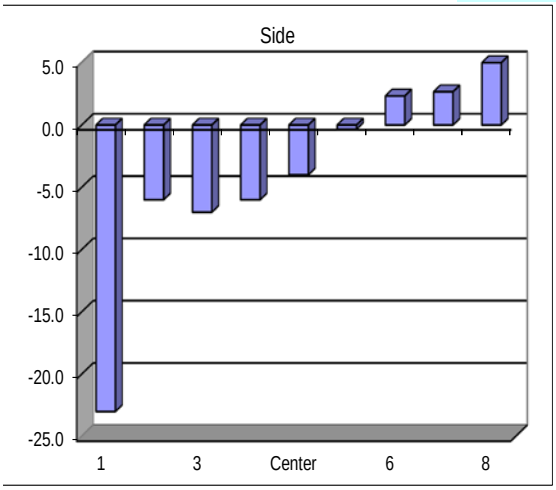
Grand mean ABS	6.4
" " w/o wall pts	4.0

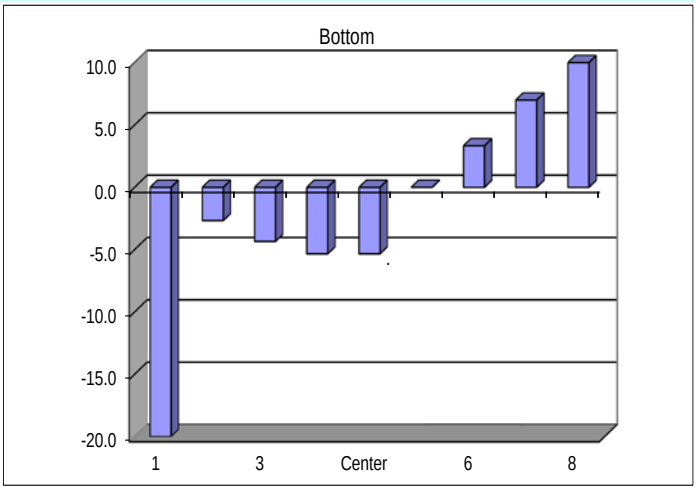
Instuments Used:		Cal. Due
S-type pitot	Dwyer 24-inch S-type Pitot#10	Cert. of conformance
Velocity sensor	TSI Velocicalc SN#T95351203001	10-Dec-13
Angle indicator	Shop built	Cat. 3
Manometer	Dwyer 400-5, S36N	Cat. 3

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA 4/24/13





Entries made by:	Carmen Arimescu
Signature/date	4/24/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/3/2013
Signature on file with original TI-WTPSP-109	

FLOW ANGLE DATA FORM

Site	LV-C2 Scale Model	Run No.	FA-8
Date	4/25/2013	Fan Setting	39 Hz
Tester	EA, CA	Fan configuration	Fan A&B
Stack Dia.	11.922 in	Approx. air vel.	3873 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	66.6
Start/End Time			

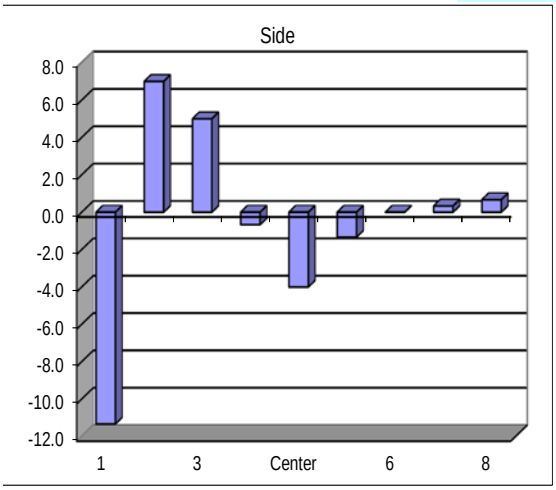
Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	-11	-10	-13	-11.3	-5	-6	-6	-5.7
2	1.25	7	7	7	7.0	10	9	9	9.3
3	2.31	5	5	5	5.0	7	8	7	7.3
4	3.85	0	0	-2	-0.7	2	0	0	0.7
Center	5.96	-3	-5	-4	-4.0	-4	-4	-2	-3.3
5	8.07	-1	-2	-1	-1.3	-3	-3	-2	-2.7
6	9.61	0	-1	1	0.0	0	0	0	0.0
7	10.67	0	0	1	0.3	2	3	3	2.7
8	11.42	0	1	1	0.7	5	4	4	4.3
Mean of absolute values:					3.4				4.0
" " w/o points by wall:					2.6				3.7
								Grand mean ABS	3.7
								" " w/o wall pts	3.2

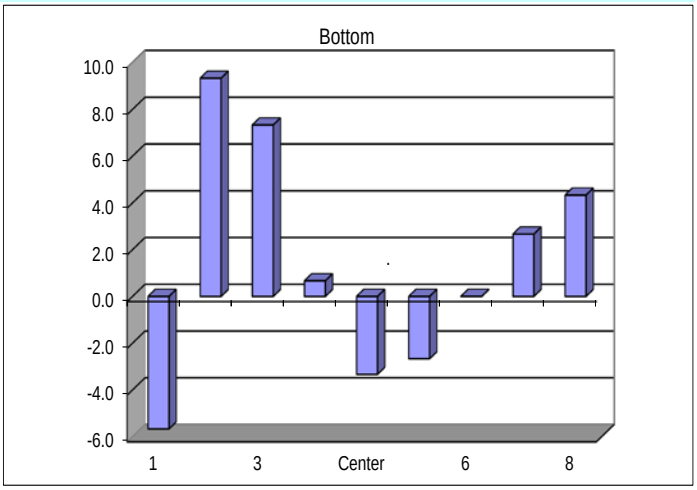
Instuments Used:		Cal. Due
S-type pitot	Dwyer 24-inch S-type Pitot#10	Cert. of conformance
Velocity sensor	TSI Velocicalc SN#T95351203001	10-Dec-13
Angle indicator	Shop built	Cat. 3
Manometer	Dwyer 400-5, S36N	Cat. 3

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA 4/25/13





Entries made by:	Carmen Arimescu
Signature/date	4/25/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/3/2013
Signature on file with original TI-WTPSP-109	

FLOW ANGLE DATA FORM

Site	LV-C2 Scale Model	Run No.	FA-9
Date	4/25/2013	Fan Setting	20.2 Hz
Tester	EA, CA	Fan configuration	Fan A&B
Stack Dia.	11.922 in	Approx. air vel.	1706 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	70
Start/End Time	1000/1017		

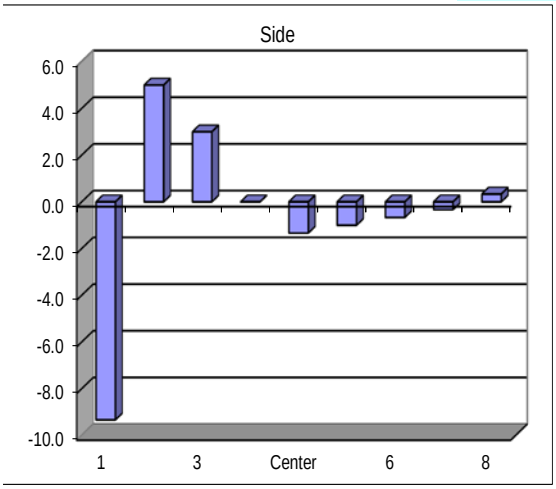
Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	-9	-9	-10	-9.3	-10	-10	-10	-10.0
2	1.25	4	6	5	5.0	4	5	6	5.0
3	2.31	2	3	4	3.0	3	4	6	4.3
4	3.85	0	0	0	0.0	0	-1	0	-0.3
Center	5.96	-2	-1	-1	-1.3	-6	-5	-6	-5.7
5	8.07	-1	-1	-1	-1.0	-4	-4	-4	-4.0
6	9.61	-2	-1	1	-0.7	-4	-3	-4	-3.7
7	10.67	0	-2	1	-0.3	0	-2	-2	-1.3
8	11.42	1	-1	1	0.3	1	0	0	0.3
Mean of absolute values:					2.3				3.9
" " w/o points by wall:					1.6				3.5
								Grand mean ABS	3.1
								" " w/o wall pts	2.5

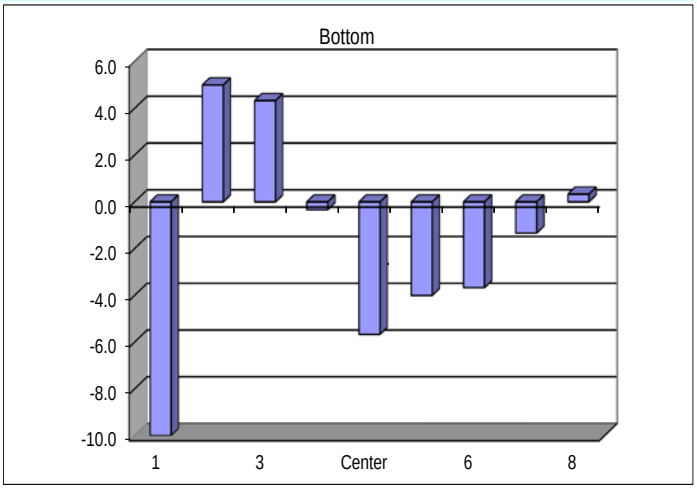
Instuments Used:		Cal. Due
S-type pitot	Dwyer 24-inch S-type Pitot#10	Cert. of conformance
Velocity sensor	TSI Velocicalc SN#T95351203001	10-Dec-13
Angle indicator	Shop built	Cat. 3
Manometer	Dwyer 400-5, S36N	Cat. 3

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA 4/25/13





Entries made by:	Carmen Arimescu
Signature/date	4/25/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/3/2013
Signature on file with original TI-WTPSP-109	

FLOW ANGLE DATA FORM

Site	**LV-C2 Scale Model**	Run No.	**FA-10**
Date	4/25/2013	Fan Setting	**30.1** Hz
Tester	EA, CA	Fan configuration	**Fan A**
Stack Dia.	11.922 in	Approx. air vel.	1850 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	72.8
Start/End Time	1020/1051		

Order -->		2nd				1st			
Traverse-->		**Side**				**Bottom**			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	-7	-10	-10	-9.0	-11	-11	-10	-10.7
2	1.25	7	3	7	5.7	2	5	0	2.3
3	2.31	3	0	0	1.0	1	1	1	1.0
4	3.85	0	0	-3	-1.0	4	-1	1	1.3
Center	5.96	-4	-4	0	-2.7	-4	-5	-4	-4.3
5	8.07	-2	-1	-2	-1.7	-3	-2	-3	-2.7
6	9.61	1	2	0	1.0	0	-1	-2	-1.0
7	10.67	4	3	0	2.3	-1	0	0	-0.3
8	11.42	6	5	2	4.3	0	1	1	0.7
Mean of absolute values:					3.2				2.7
" " w/o points by wall:					2.2				1.9

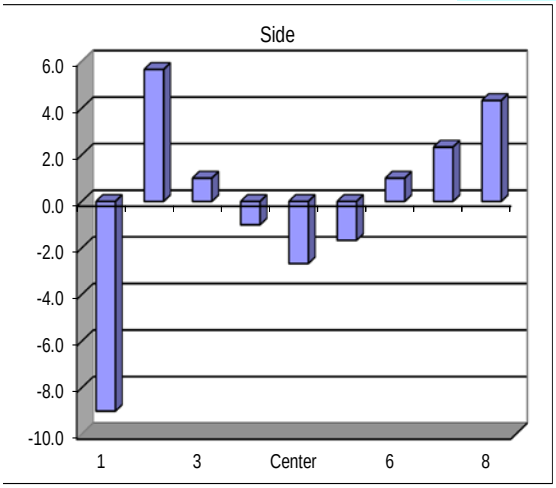
Grand mean ABS	2.9
" " w/o wall pts	2.0

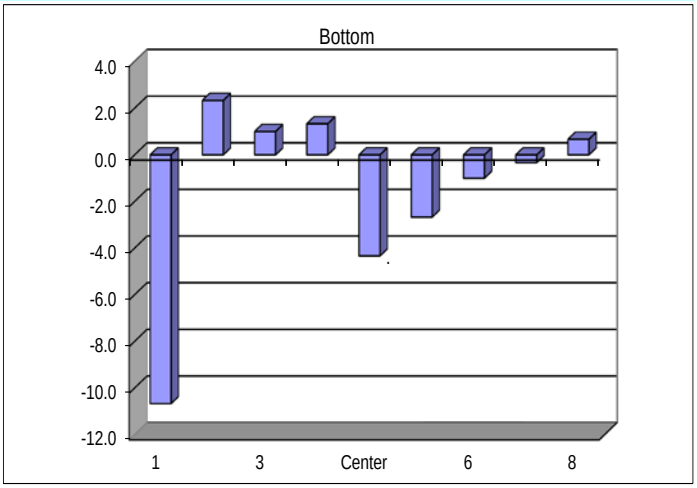
Instuments Used:		**Cal. Due**
S-type pitot	Dwyer 24-inch S-type Pitot#10	Cert. of conformance
Velocity sensor	TSI Velocicalc SN#T95351203001	10-Dec-13
Angle indicator	Shop built	Cat. 3
Manometer	Dwyer 400-5, S36N	Cat. 3

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA 4/25/13





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	4/25/2013	Signature/date	6/3/2013
		Signature on file with original TI-WTPSP-109	

B.5 LV-C2 Gas Tracer Calibration and Uniformity Data Sheets

GAS ANALYZER CALIBRATION

Site	LV-C2 Model	Instrument	B&K Model 1302
Date	5/17/2013	Serial No.	1804888
Testers	JEF, EA	Property No.	WD54623

Setup:
- 6.3 ft B&K sample inlet tube length
- 1011 mbar station pressure
- 74.3 deg F ambient temp analyzer corrects to 20 deg C
- 29 percent RH

Pre-Test background, ppb

Compensating for water vapor, monitoring task 2

481, 484, 453, 472, 437

	1.99 ppm		59.9 ppm
Cylinder	SV17699	Cylinder	SV17805
start P =	1700 psi	start P =	1500 psi
end P =	1700 psi	end P =	1500 psi

B&K Calibration readings: (ppm)		B&K Calibration readings: (ppm)	
2.05		59.7	
2.07		60.6	
2.06		60.8	
2.05		60.5	
2.06		60.6	
2.04		60.5	
2.03		60.4	
2.02		60.2	
2.02		60.5	
2.03		60.4	
2.03		60.3	
2.04	= avg	**60.4**	= avg
1.026	=avg/std	**1.008**	=avg/std

Standards Used:	Expiration date:
Air Liquide 1.99 ppm N2O in air, SV17699	6/1/2014
Air Liquide 59.6 ppm N2O in air, SV17805	6/1/2014
Weather Station Used:	
Fisher Scientific S/N 90936818	12/11/2013

Entries made by:	Julia Flaherty		Technical Data Review performed by:	Elizabeth Golovich
Signature/date	*On File w/ Original*	5/17/2013	Signature/date	7/17/2013
			Signature on file with original TI-WTPSP-111	

GAS ANALYZER CALIBRATION

Site	LV-C2 Model	Instrument	B&K Model 1302
Date	5/28/2013	Serial No.	1804888
Testers	EA, CA	Property No.	WD54623

Setup:
- 6.3 ft B&K sample inlet tube length
- 1011 mbar station pressure
- 63.5 deg F ambient temp analyzer corrects to 20 deg C
- 41 percent RH

Pre-Test background, ppb
Compensating for water vapor, monitoring task 2
457, 413, 430, 429, 400

	1.99	ppm		59.9	ppm
Cylinder	SV17699		Cylinder	SV17805	
start P =	1600	psi	start P =	1400	psi
end P =	1600	psi	end P =	1400	psi

B&K Calibration readings: (ppm)		B&K Calibration readings: (ppm)	
2.11		60.0	
2.09		62.0	
2.10		61.9	
2.09		61.8	
2.08		61.9	
2.09		61.9	
2.07		61.8	
2.05		61.7	
2.07		61.8	
2.06		61.4	
2.06		61.3	
2.08	= avg	**61.6**	= avg
1.045	=avg/std	**1.028**	=avg/std

Standards Used:	Expiration date:
Air Liquide 1.99 ppm N2O in air, SV17699	6/1/2014
Air Liquide 59.6 ppm N2O in air, SV17805	6/1/2014
Weather Station Used:	
Fisher Scientific S/N 90936818	12/11/2013

Entries made by: Carmen Arimescu	Technical Data Review performed by: Elizabeth Golovich
Signature/date 5/28/2013	Signature/date 7/17/2013
	Signature on file with original TI-WTPSP-111

GAS ANALYZER CALIBRATION

Site	LV-C2 Model	Instrument	B&K Model 1302
Date	6.3.2013	Serial No.	1804888
Testers	EA	Property No.	WD54623

Setup:
- 6.3 ft B&K sample inlet tube length
- 1014 mbar station pressure
- 66 deg F ambient temp analyzer corrects to 20 deg C
- 32 percent RH

Pre-Test background, ppb

Compensating for water vapor, monitoring task 2

498, 469, 473, 425, 421

	1.99 ppm		59.9 ppm
Cylinder	SV17699	Cylinder	SV17805
start P =	1600 psi	start P =	1400 psi
end P =	1600 psi	end P =	1400 psi

B&K Calibration readings: (ppm)	B&K Calibration readings: (ppm)
2.07	61.4
2.11	61.8
2.11	61.9
2.14	61.8
2.12	61.6
2.11	61.7
2.10	61.7
2.10	61.5
2.09	61.5
2.08	61.6
2.06	61.4
2.10 = avg	**61.6** = avg
1.055 =avg/std	**1.029** =avg/std

Standards Used:	Expiration date:
Air Liquide 1.99 ppm N2O in air, SV17699	6/1/2014
Air Liquide 59.6 ppm N2O in air, SV17805	6/1/2014
Weather Station Used:	
Fisher Scientific S/N 90936818	12/11/2013

Entries made by: Carmen Arimescu	Technical Data Review performed by: Elizabeth Golovich
Signature/date 5/28/2013	Signature/date 7/17/2013
	Signature on file with original TI-WTPSP-111

GAS ANALYZER CALIBRATION

Site	LV-C2 Model	Instrument	B&K Model 1302
Date	6/10/2013	Serial No.	1804888
Testers	EA, CA	Property No.	

Setup:
- 6.3 ft B&K sample inlet tube length
- 1015 mbar station pressure
- 67.1 deg F ambient temp — analyzer corrects to 20 deg C
- 32% percent RH

Pre-Test background, ppb
Compensating for water vapor, monitoring task 2
460, 434, 437, 411, 421

	1.99	ppm		59.9	ppm
Cylinder	SV17699		Cylinder	SV17805	
start P =	1600	psi	start P =	1400	psi
end P =	1600	psi	end P =	1400	psi

B&K Calibration readings: (ppm)		B&K Calibration readings: (ppm)	
2.02		58.6	
1.99		59.0	
1.98		59.5	
2.00		59.3	
2.00		59.5	
1.99		59.4	
1.98		59.4	
1.97		59.4	
1.98		59.3	
1.97		59.4	
1.97		59.2	
1.99	= avg	**59.3**	= avg
0.998	=avg/std	**0.990**	=avg/std

Standards Used:	Expiration date:
Air Liquide 1.99 ppm N2O in air, SV17699	6/1/2014
Air Liquide 59.6 ppm N2O in air, SV17805	6/1/2014
Weather Station Used:	
Fisher Scientific S/N 90936818	12/11/2013

Entries made by: Carmen Arimescu	Technical Data Review performed by: Elizabeth Golovich
Signature/date 6/10/2013	Signature/date 7/17/2013
	Signature on file with original TI-WTPSP-111

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-1**
Date	5/20/2013	Fan Configuration	**Fan B**
Testers	EA, CA	Fan Setting	**27.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	80.35 deg F
Stack X-Area	111.6 in.2	Start/End Time	930/1240
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2** Center

Order -->		2nd				1st				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	31.1	29.5	30.7	30.4	30.1	30.9	29.6	30.2
2	1.25	29.9	30.1	31.1	30.4	29.6	30.1	29.9	29.9
3	2.31	29.5	30.5	30.5	30.2	30.2	29.9	29.1	29.7
4	3.85	29.9	29.8	29.3	29.7	29.6	29.4	30.4	29.8
Center	5.96	29.8	29.5	29.3	29.5	30.1	29.9	30.0	30.0
5	8.07	29.4	29.1	28.7	29.1	31.1	30.3	30.4	30.6
6	9.61	29.3	28.7	28.6	28.9	30.8	30.2	30.6	30.5
7	10.67	28.9	29.3	29.9	29.4	30.3	29.8	30.4	30.2
8	11.42	28.7	27.7	28.8	28.4	31.1	31.5	31.1	31.2
Averages ---------->		29.6	29.4	29.7	29.5	30.3	30.2	30.2	30.2

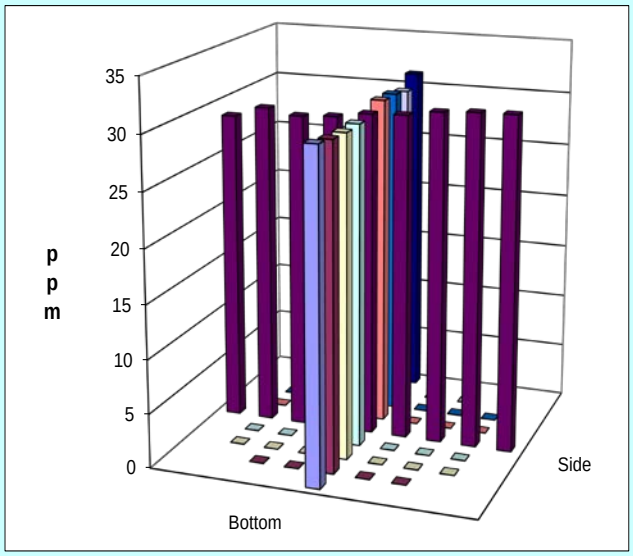
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	29.89		Mean	29.58	30.10	29.84
Min Point	28.40	-5.0%	Std. Dev.	0.55	0.35	0.52
Max Point	31.23	4.5%	COV as %	1.8	1.2	**1.7**

Avg. Conc. 29.904 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	800	800	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	78.6	82.1	°F
Mean stack velocity	1848	1806	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1023	1024	mbar
Ambient humidity	29%	22%	RH
Ambient Temp	70.7	79.7	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.4,.4,.4,.4,.4	.5,.4,.3,.3,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 5/17/2013

Notes: Mean velocity measured at side center.

CA 5/20/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	5/20/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-2**
Date	5/20/2013	Fan Configuration	**Fan B**
Testers	EA, CA	Fan Setting	**27.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	86 deg F
Stack X-Area	111.6 in.2	Start/End Time	130/300
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2** Bottom

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	30.9	31.2	31.7	31.3	30.7	30.8	30.7	30.7
2	1.25	31.1	31.7	31.2	31.3	30.7	30.3	30.6	30.5
3	2.31	30.8	31.2	31.1	31.0	30.7	30.6	30.6	30.6
4	3.85	30.9	30.8	30.8	30.8	31.0	30.2	30.9	30.7
Center	5.96	30.9	31.3	31.1	31.1	31.0	30.8	31.2	31.0
5	8.07	30.0	30.3	30.5	30.3	31.5	31.0	31.0	31.2
6	9.61	29.7	30.0	30.2	30.0	31.1	31.2	31.5	31.3
7	10.67	29.3	29.8	29.4	29.5	31.1	31.9	32.1	31.7
8	11.42	30.2	29.2	29.3	29.6	32.0	31.7	31.8	31.8
Averages ---------->		30.4	30.6	30.6	30.5	31.1	30.9	31.2	31.1

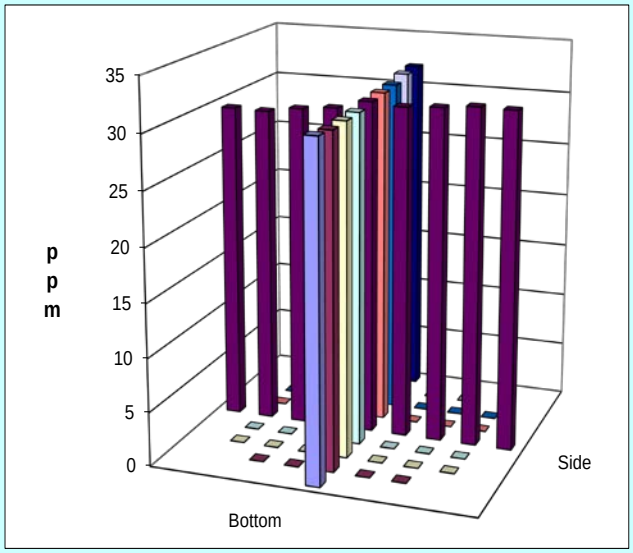
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	30.80		Mean	30.58	31.00	30.79
Min Point	29.50	-4.2%	Std. Dev.	0.68	0.41	0.58
Max Point	31.83	3.3%	COV as %	2.2	1.3	**1.9**

Avg. Conc. 30.771 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	850	900	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	86	86	°F
Mean stack velocity	1844	1808	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1024	1024	mbar
Ambient humidity	19%	22%	RH
Ambient Temp	90.5	81.5	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.3,.3,.3,.3,.3	.5,.4,.4,.3,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 5/17/2013

Notes: Mean velocity measured at side center.

CA 5/20/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	5/20/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-3**
Date	5/20/2013	Fan Configuration	**Fan B**
Testers	EA, CA	Fan Setting	**27.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	86.45 deg F
Stack X-Area	111.6 in.2	Start/End Time	300/430
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2** Top

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	28.2	28.4	28.6	28.4	31.0	31.3	31.1	31.1
2	1.25	27.3	28.0	28.7	28.0	30.9	31.5	30.5	31.0
3	2.31	29.4	28.7	28.5	28.9	30.8	30.9	30.8	30.8
4	3.85	30.1	29.4	30.1	29.9	29.8	30.0	29.3	29.7
Center	5.96	30.6	30.2	31.0	30.6	30.7	30.2	30.2	30.4
5	8.07	31.6	31.7	31.9	31.7	28.7	30.8	28.7	29.4
6	9.61	33.4	32.5	33.7	33.2	30.7	29.0	30.1	29.9
7	10.67	33.5	34.0	34.1	33.9	28.8	29.7	30.0	29.5
8	11.42	33.7	35.8	34.4	34.6	27.3	28.1	27.8	27.7
Averages ---------->		30.9	31.0	31.2	31.0	29.9	30.2	29.8	30.0

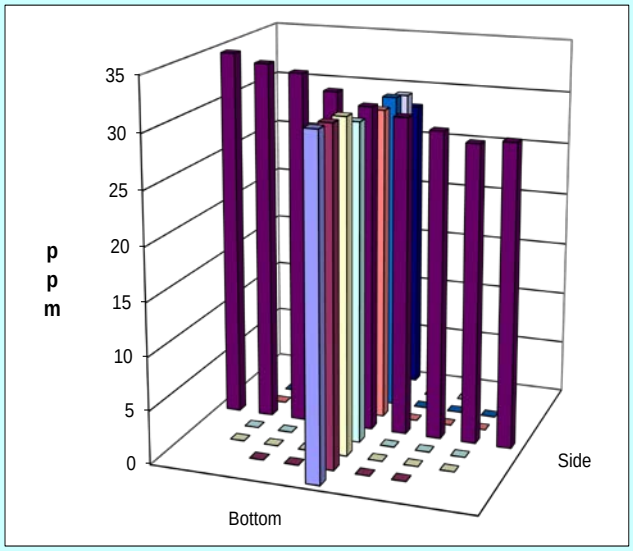
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	30.49		Mean	30.88	30.10	30.49
Min Point	27.73	-9.0%	Std. Dev.	2.18	0.63	1.59
Max Point	34.63	13.6%	COV as %	7.1	2.1	**5.2**

Avg. Conc. 30.485 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	900	900	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	86	86.9	°F
Mean stack velocity	1808	1803	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1024	1025	mbar
Ambient humidity	22%	20%	RH
Ambient Temp	83.3	90.5	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.5,.4,.4,.3,.3	.6,.4,.3,.3,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 5/17/2013

Notes: Mean velocity measured at side center.

CA 5/20/13

Entries made by: Carmen Arimescu
Signature/date 5/20/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 7/17/2013
Signature on file with original TI-WTPSP-111

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-4**
Date	5/21/2013	Fan Configuration	**Fan B**
Testers	EA, CA	Fan Setting	**56** **Hz**
Stack Dia.	11.922 in.	Stack Temp	73.65 deg F
Stack X-Area	111.6 in.2	Start/End Time	845/1045
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	I2 Center

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	32.0	32.2	35.1	33.1	39.3	44.0	46.3	43.2
2	1.25	32.0	31.1	34.9	32.7	38.9	43.6	46.1	42.9
3	2.31	31.9	31.4	35.7	33.0	39.0	43.4	46.1	42.8
4	3.85	30.8	31.2	35.7	32.6	39.7	44.0	46.1	43.3
Center	5.96	30.6	31.6	35.2	32.5	39.8	42.6	46.9	43.1
5	8.07	30.4	31.3	35.5	32.4	40.3	43.5	47.1	43.6
6	9.61	30.9	31.5	35.9	32.8	40.6	44.8	47.8	44.4
7	10.67	31.0	32.4	36.6	33.3	41.6	44.5	46.9	44.3
8	11.42	30.9	33.6	37.3	33.9	41.8	45.5	49.0	45.4
Averages ---------->		31.2	31.8	35.8	32.9	40.1	44.0	46.9	43.7

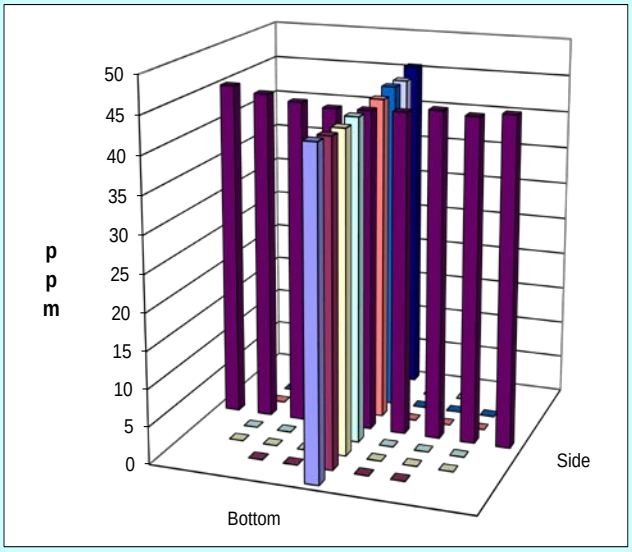
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	38.29		Mean	32.74	43.49	38.12
Min Point	32.40	-15.4%	Std. Dev.	0.33	0.66	5.60
Max Point	45.43	18.6%	COV as %	1.0	1.5	**14.7**

Avg. Conc. 38.358 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	800	800	psig
Injection flowmeter	3.2	3.2	slpm
Stack Temp	73.3	74	°F
Mean stack velocity	3918	3899	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1013	1012	mbar
Ambient humidity	39%	28%	RH
Ambient Temp	74.3	73.4	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.4,.4,.4,.4,.4	.6,.4,.4,.4,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 5/17/2013

Notes: Mean velocity=Side Center

Mass flow controler was variable.

It was windy.

At the end of the test our flexible duct came off.

CA 5/21/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	5/21/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

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TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-5**
Date	5/23/2013	Fan Configuration	**Fan B**
Testers	EA, CA	Fan Setting	**55.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	62.6 deg F
Stack X-Area	111.6 in.2	Start/End Time	830/1100
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2 Center**

Order -->		2nd				1st				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	32.7	32.4	32.6	32.6	32.5	33.1	32.7	32.8
2	1.25	32.8	32.4	32.5	32.6	32.8	33.1	32.4	32.8
3	2.31	32.9	32.5	32.4	32.6	33.1	33.0	32.3	32.8
4	3.85	32.9	32.6	32.5	32.7	33.1	33.0	32.3	32.8
Center	5.96	32.9	32.5	32.5	32.6	33.0	32.9	32.3	32.7
5	8.07	32.7	32.5	32.5	32.6	33.0	32.9	32.3	32.7
6	9.61	32.6	32.5	32.4	32.5	33.1	32.8	32.3	32.7
7	10.67	32.5	32.5	32.4	32.5	33.0	32.8	32.4	32.7
8	11.42	32.4	32.5	32.3	32.4	33.0	32.8	32.5	32.8
Averages --------->		32.7	32.5	32.5	32.6	33.0	32.9	32.4	32.8

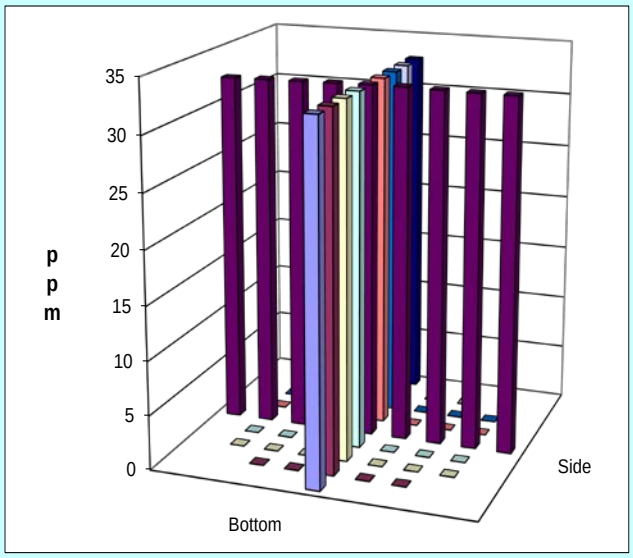
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	32.66		Mean	32.57	32.76	32.66
Min Point	32.40	-0.8%	Std. Dev.	0.07	0.03	0.11
Max Point	32.80	0.4%	COV as %	0.2	0.1	**0.3**

Avg. Conc. 32.652 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	700	650	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	57.5	67.7	°F
Mean stack velocity	3899	3776	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1014	1015	mbar
Ambient humidity	33%	26%	RH
Ambient Temp	65.4	71.6	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.8,.8,.8,.8,.8	.4,.4,.3,.3,.3,	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: CA 5/17/2013

Notes: Mean Velocity=Side Center

During this test B&K shut down 2 times

CA 5/23/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	5/23/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

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TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-6**
Date	5/23/113	Fan Configuration	**Fan A&B**
Testers	EA, CA	Fan Setting	**41.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	67.45 deg F
Stack X-Area	111.6 in.2	Start/End Time	1105/1300
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	I2 Center

Order -->		1st				2nd				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	26.1	28.0	28.0	27.4	28.2	25.9	26.2	26.8
2	1.25	26.6	28.4	28.4	27.8	29.1	26.1	26.4	27.2
3	2.31	26.8	28.6	28.5	28.0	29.7	26.6	26.5	27.6
4	3.85	26.8	28.6	24.9	26.8	30.0	27.0	26.8	27.9
Center	5.96	26.9	28.4	25.2	26.8	29.8	27.2	27.1	28.0
5	8.07	27.1	28.3	25.2	26.9	29.3	27.2	27.3	27.9
6	9.61	27.3	28.1	25.9	27.1	28.3	27.3	27.4	27.7
7	10.67	27.8	28.1	26.6	27.5	27.2	27.2	27.3	27.2
8	11.42	27.8	27.8	27.3	27.6	25.7	25.8	25.8	25.8
Averages ---------->		27.0	28.3	26.7	27.3	28.6	26.7	26.8	27.3

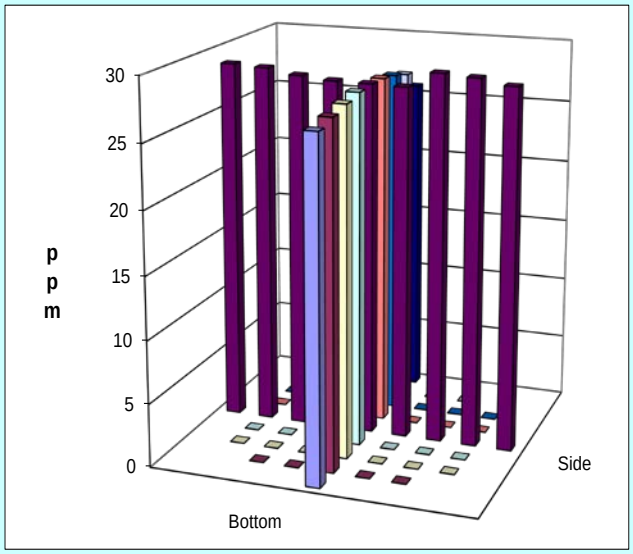
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	27.33		Mean	27.26	27.66	27.46
Min Point	25.77	-5.7%	Std. Dev.	0.49	0.34	0.45
Max Point	28.03	2.6%	COV as %	1.8	1.2	**1.7**

Avg. Conc. 27.319 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	700	700	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	67	67.9	°F
Mean stack velocity	3922	3929	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1015	1016	mbar
Ambient humidity	25%	27%	RH
Ambient Temp	70.7	69.8	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.3,.3,.3,.3,.3	.3,.3,.3,.3,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: CA 5/17/2013

Notes: Mean Velocity=Bottom 8

During this test B&K shut down once.

CA 5/23/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	5/23/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

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TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-7**
Date	5/23/2013	Fan Configuration	**Fan A&B**
Testers	EA, CA	Fan Setting	**41.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	69.6 deg F
Stack X-Area	111.6 in.2	Start/End Time	253/400
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2 Bottom**

Order -->		1st				2nd				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	ppm				ppm				
1	0.50	28.4	29.0	29.2	28.9	30.0	28.2	28.4	28.9	
2	1.25	28.2	29.9	28.8	29.0	29.6	28.3	28.3	28.7	
3	2.31	28.0	29.4	28.6	28.7	29.3	28.2	28.2	28.6	
4	3.85	28.1	29.1	28.4	28.5	29.2	28.2	28.2	28.5	
Center	5.96	28.1	28.9	28.1	28.4	29.2	28.2	28.3	28.6	
5	8.07	25.5	28.7	27.9	27.4	29.0	28.3	28.4	28.6	
6	9.61	26.4	28.7	30.7	28.6	28.7	28.4	28.4	28.5	
7	10.67	26.7	28.6	30.9	28.7	28.3	28.4	28.4	28.4	
8	11.42	27.0	29.2	30.6	28.9	28.3	28.4	28.3	28.3	
Averages ---------->		27.4	29.1	29.2	28.6	29.1	28.3	28.3	28.6	

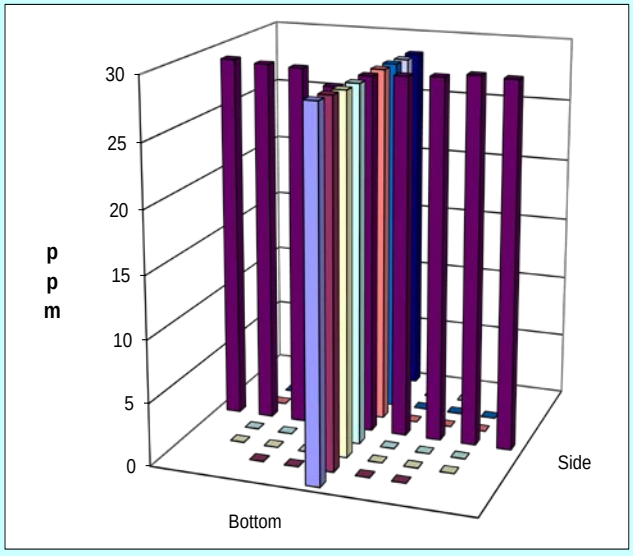
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	28.56		Mean	28.46	28.55	28.50
Min Point	27.37	-4.2%	Std. Dev.	0.52	0.11	0.36
Max Point	28.97	1.4%	COV as %	1.8	0.4	**1.3**

Avg. Conc. 28.571 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	700	700	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	71.4	67.8	°F
Mean stack velocity	3839	3930	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1016	1013	mbar
Ambient humidity	22%	24%	RH
Ambient Temp	82.4	69.8	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.4,.4,.4,.4,.4	.4,.4,.3,.3,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: CA 5/17/2013

Notes: Mean Velocity=Bottom 8

During this test B&K shut down once.

CA 5/23/13

Entries made by:	Carmen Arimescu
Signature/date	5/23/2013

Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-111	

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TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-8**
Date	5/24/2013	Fan Configuration	**Fan A&B**
Testers	EA, CA	Fan Setting	**41.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	58.65 deg F
Stack X-Area	111.6 in.2	Start/End Time	915/1100
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	I2 Bottom

		1st				2nd			
Order -->									
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	28.0	28.0	27.0	27.7	29.2	28.6	28.4	28.7
2	1.25	28.4	28.1	27.8	28.1	29.0	28.6	28.7	28.8
3	2.31	29.2	28.5	28.3	28.7	29.1	29.2	29.6	29.3
4	3.85	30.2	28.9	29.0	29.4	29.7	29.2	29.4	29.4
Center	5.96	31.0	30.2	30.4	30.5	29.8	29.7	29.4	29.6
5	8.07	32.2	31.3	31.6	31.7	30.4	29.6	29.9	30.0
6	9.61	32.8	31.4	32.2	32.1	29.5	29.3	28.8	29.2
7	10.67	33.1	32.6	31.4	32.4	28.5	29.2	28.6	28.8
8	11.42	32.3	32.7	31.9	32.3	28.2	28.1	28.9	28.4
Averages ---------->		30.8	30.2	30.0	30.3	29.3	29.1	29.1	29.1

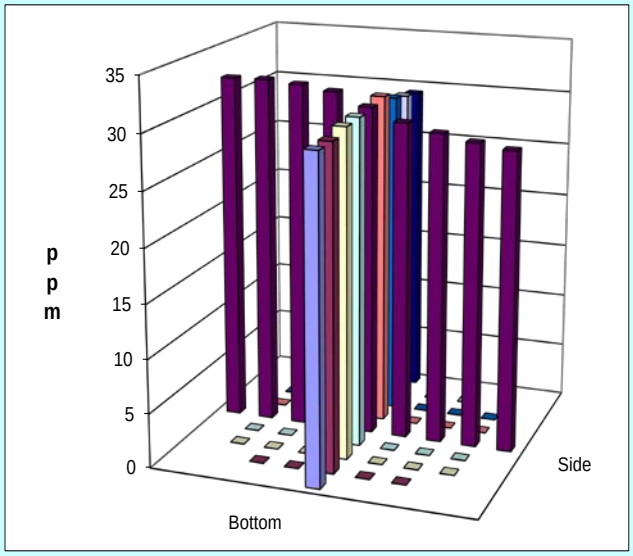
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	29.72		Mean	30.41	29.30	29.85
Min Point	27.67	-6.9%	Std. Dev.	1.73	0.44	1.34
Max Point	32.37	8.9%	COV as %	5.7	1.5	**4.5**

Avg. Conc. 29.679 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN	1804888	Cat2 M&TE
TSI VelociCalc	SN	T95351203001	12/10/2013
Fisher Scientific	SN	90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	600	600	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	55.5	61.8	°F
Mean stack velocity	3883	3929	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1017	1016	mbar
Ambient humidity	46%	41%	RH
Ambient Temp	59.9	63.5	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.4,.4,.4,.4,.4	.5,.4,.4,.3,.4	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 5/17/2013

Notes: Mean Vel= Bottom 8

GT-8 is a retesting of GT-7

CA 5/24/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	5/24/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

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TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-9**
Date	5/24/2013	Fan Configuration	**Fan A&B**
Testers	EA, CA	Fan Setting	**41.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	57 deg F
Stack X-Area	111.6 in.2	Start/End Time	1105/1250
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	I2 Center

Order -->		2nd				1st				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	ppm				ppm				
1	0.50	30.3	29.7	30.5	30.2	34.3	34.9	36.0	35.1	
2	1.25	29.3	28.7	29.5	29.2	33.4	33.1	32.7	33.1	
3	2.31	28.7	26.7	27.9	27.8	30.3	31.1	31.4	30.9	
4	3.85	27.2	25.7	25.5	26.1	27.5	27.9	29.2	28.2	
Center	5.96	25.9	26.5	25.4	25.9	26.4	26.7	26.2	26.4	
5	8.07	28.0	28.0	28.5	28.2	25.4	25.0	24.6	25.0	
6	9.61	30.5	29.1	30.5	30.0	24.0	23.6	23.2	23.6	
7	10.67	31.4	31.7	33.0	32.0	22.3	23.5	24.4	23.4	
8	11.42	31.8	33.1	31.9	32.3	23.5	23.6	21.2	22.8	
Averages ---------->		29.2	28.8	29.2	29.1	27.5	27.7	27.7	27.6	

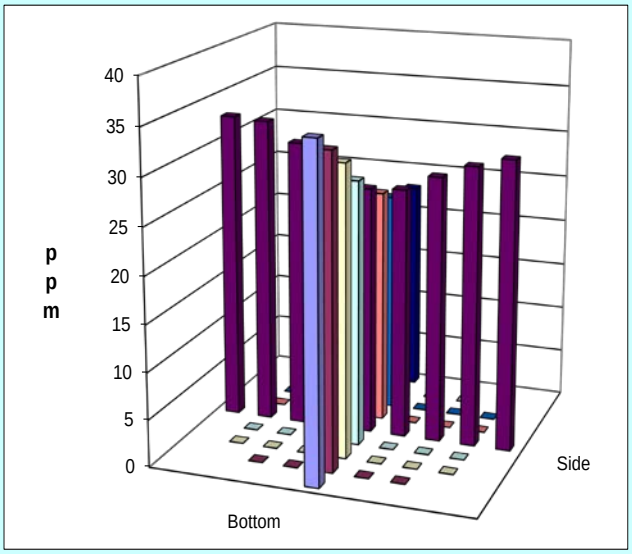
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	28.34		Mean	28.46	27.23	27.85
Min Point	22.77	-19.7%	Std. Dev.	2.16	3.70	2.98
Max Point	35.07	23.7%	COV as %	7.6	13.6	**10.7**

Avg. Conc. 28.610 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	600	600	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	61.8	52.2	°F
Mean stack velocity	3929	4002	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1016	1017	mbar
Ambient humidity	34%	55%	RH
Ambient Temp	68.6	59.9	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.5,.4,.3,.3,.3	.6,.4,.4,.3,.4	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 5/17/2013

Notes: Mean Vel= Bottom 8

GT-9 is a retesting of GT-6

Starting raining = 2nd

CA 5/24/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	5/24/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

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TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-10**
Date	5/28/2013	Fan Configuration	**Fan B**
Testers	EA, CA	Fan Setting	**56** **Hz**
Stack Dia.	11.922 in.	Stack Temp	75.1 deg F
Stack X-Area	111.6 in.2	Start/End Time	1030/1215
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2** Center

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	32.8	33.3	32.4	32.8	32.4	31.6	32.7	32.2
2	1.25	33.2	32.4	32.7	32.8	31.8	31.7	32.0	31.8
3	2.31	32.6	32.6	32.4	32.5	31.7	32.1	31.9	31.9
4	3.85	33.1	32.8	32.8	32.9	31.4	31.4	31.5	31.4
Center	5.96	41.7	32.0	32.0	35.2	31.9	31.4	31.6	31.6
5	8.07	31.8	31.6	31.8	31.7	32.2	32.1	31.7	32.0
6	9.61	31.2	31.5	31.7	31.5	32.5	31.5	31.8	31.9
7	10.67	32.0	31.5	31.8	31.8	32.6	32.2	32.9	32.6
8	11.42	32.2	31.5	32.1	31.9	32.6	33.0	32.4	32.7
Averages ---------->		33.4	32.1	32.2	32.6	32.1	31.9	32.1	32.0

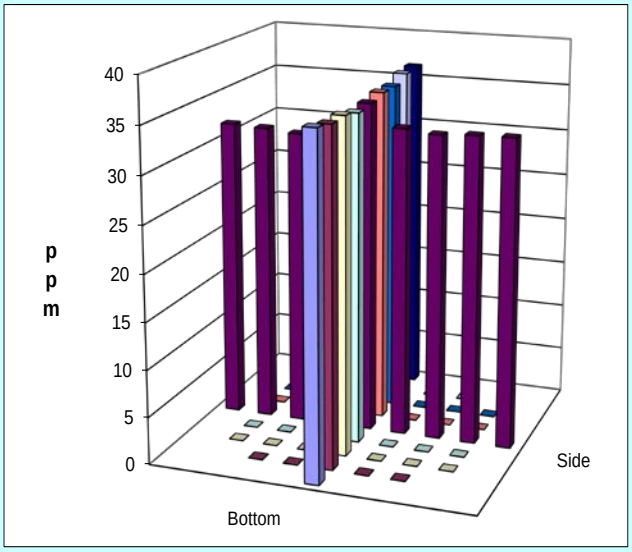
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	32.30		Mean	32.63	31.90	32.26
Min Point	31.43	-2.7%	Std. Dev.	1.28	0.35	0.98
Max Point	35.23	9.1%	COV as %	3.9	1.1	**3.0**

Avg. Conc. 32.156 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	750	750	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	75.9	74.3	°F
Mean stack velocity	3848	3880	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1011	1010	mbar
Ambient humidity	31%	28%	RH
Ambient Temp	75.2	75.2	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.3,.3,.3,.3,.3	.5,.3,.3,.3,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 5/28/2013

Notes: Mean Vel.=Side Center

CA 5/28/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	5/28/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

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TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-11**
Date	5/28/2013	Fan Configuration	**Fan A MAX**
Testers	CA,EA	Fan Setting	**59 Hz**
Stack Dia.	11.922 in.	Stack Temp	77.55 deg F
Stack X-Area	111.6 in.2	Start/End Time	1220/1415
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2 Center**

		Side				Bottom			
Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	30.3	30.1	30.1	30.2	30.6	31.4	31.0	31.0
2	1.25	29.9	30.7	30.3	30.3	30.1	30.7	31.1	30.6
3	2.31	30.7	30.0	31.2	30.6	30.9	30.5	30.6	30.7
4	3.85	31.0	30.7	31.1	30.9	31.3	30.4	30.9	30.9
Center	5.96	30.7	30.7	30.7	30.7	31.2	30.5	30.3	30.7
5	8.07	31.6	31.0	31.0	31.2	30.7	30.8	30.9	30.8
6	9.61	30.7	31.0	30.8	30.8	30.6	30.8	30.7	30.7
7	10.67	31.1	31.2	30.8	31.0	31.4	31.4	30.8	31.2
8	11.42	31.5	30.6	31.2	31.1	31.0	30.5	30.5	30.7
Averages ---------->		30.8	30.7	30.8	30.8	30.9	30.8	30.8	30.8

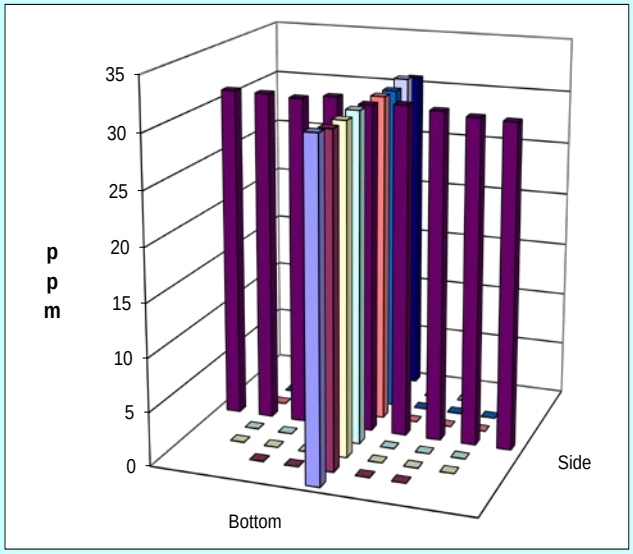
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	30.78		Mean	30.80	30.79	30.80
Min Point	30.17	-2.0%	Std. Dev.	0.29	0.20	0.24
Max Point	31.20	1.4%	COV as %	1.0	0.6	**0.8**

Avg. Conc. 30.796 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	750	750	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	74.2	80.9	°F
Mean stack velocity	3817	3833	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1010	1009	mbar
Ambient humidity	26%	23%	RH
Ambient Temp	76.1	80.6	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.3,.3,.3,.3,.3	.5,.3,.3,.3,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 5/28/2013

Notes: Mean Vel. = Side 8

CA 5/28/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	5/28/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

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TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-12**
Date	5/29/2013	Fan Configuration	**Fan A**
Testers	EA,CA	Fan Setting	**59.1** **Hz**
Stack Dia.	11.922 in.	Stack Temp	68.05 deg F
Stack X-Area	111.6 in.2	Start/End Time	1030/1230
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2 Center**

Order -->		2nd				1st				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	ppm				ppm				
1	0.50	31.7	32.1	31.8	31.9	33.3	33.5	33.2	33.3	
2	1.25	31.7	32.6	32.0	32.1	33.9	33.4	33.7	33.7	
3	2.31	32.0	31.9	31.7	31.9	34.1	33.5	32.8	33.5	
4	3.85	32.7	32.0	31.5	32.1	33.9	33.7	33.4	33.7	
Center	5.96	32.6	32.6	31.9	32.4	34.1	33.3	32.5	33.3	
5	8.07	31.9	32.3	31.8	32.0	33.5	33.3	32.4	33.1	
6	9.61	32.6	33.3	32.2	32.7	33.9	33.5	32.4	33.3	
7	10.67	32.8	32.5	31.6	32.3	34.0	32.9	33.5	33.5	
8	11.42	33.1	32.8	32.3	32.7	33.5	32.8	32.8	33.0	
Averages ---------->		32.3	32.5	31.9	32.2	33.8	33.3	33.0	33.4	

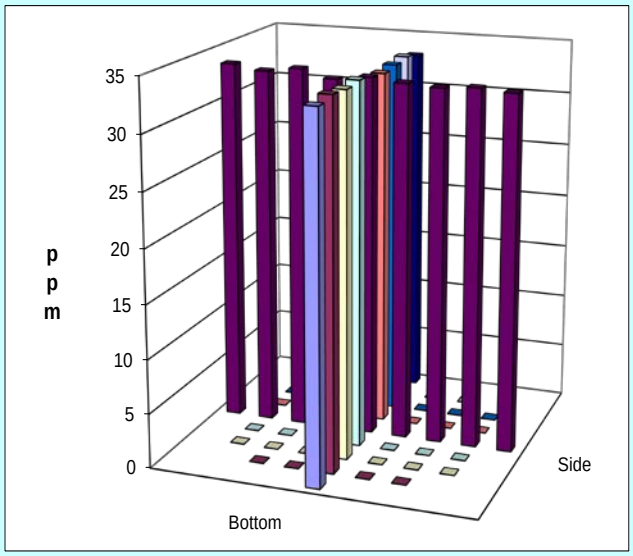
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	32.79		Mean	32.20	33.41	32.81
Min Point	31.87	-2.8%	Std. Dev.	0.28	0.22	0.67
Max Point	33.67	2.7%	COV as %	0.9	0.7	**2.1**

Avg. Conc. 32.788 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	600	600	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	65.4	70.7	°F
Mean stack velocity	3836	3913	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1010	1010	mbar
Ambient humidity	38%	40%	RH
Ambient Temp	69.8	70.7	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.4,.4,.4,.4,.4	.5,.4,.3,.3,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 5/28/2013

Notes: Mean Vel. = Side 8

CA 5/29/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	5/29/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-13**
Date	5/30/2013	Fan Configuration	**Fan A**
Testers	EA, CA	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	66 deg F
Stack X-Area	111.6 in.2	Start/End Time	850/1025
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2 Bottom**

Order -->		2nd				1st				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	ppm				ppm				
1	0.50	30.6	31.4	31.5	31.2	34.3	34.2	32.4	33.6	
2	1.25	31.7	32.0	30.5	31.4	33.7	33.5	33.7	33.6	
3	2.31	31.9	31.1	31.6	31.5	33.4	33.7	32.6	33.2	
4	3.85	32.3	31.7	31.4	31.8	33.8	32.8	32.4	33.0	
Center	5.96	32.7	31.9	32.1	32.2	33.2	33.2	32.3	32.9	
5	8.07	32.9	33.2	32.9	33.0	33.9	33.6	32.5	33.3	
6	9.61	33.2	33.2	32.4	32.9	34.6	33.8	33.2	33.9	
7	10.67	33.3	33.8	33.7	33.6	34.4	33.3	32.9	33.5	
8	11.42	33.7	32.9	33.2	33.3	33.9	33.5	32.7	33.4	
Averages --------->		32.5	32.4	32.1	32.3	33.9	33.5	32.7	33.4	

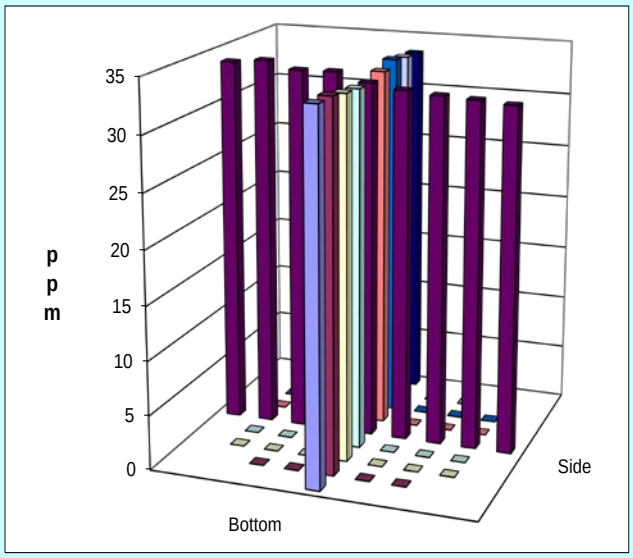
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	32.86		Mean	32.36	33.36	32.86
Min Point	31.17	-5.1%	Std. Dev.	0.84	0.35	0.81
Max Point	33.87	3.1%	COV as %	2.6	1.0	**2.5**

Avg. Conc. 32.894 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	650	650	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	65.5	66.5	°F
Mean stack velocity	3887	4043	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1008	1008	mbar
Ambient humidity	32%	33%	RH
Ambient Temp	68.9	67.1	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.4,.4,.4,.4,.4	.5,.4,.6,.4,.4	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 5/28/2013

Notes: Mean Vel = Side 8

CA 5/30/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	5/30/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-14**
Date	5/30/2013	Fan Configuration	**Fan A**
Testers	EA, CA	Fan Setting	**59.1** **Hz**
Stack Dia.	11.922 in.	Stack Temp	69.2 deg F
Stack X-Area	111.6 in.2	Start/End Time	1035/1205
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2 Top**

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	32.1	33.2	32.4	32.6	31.4	30.6	31.8	31.3
2	1.25	32.9	33.3	33.4	33.2	31.0	30.8	30.7	30.8
3	2.31	32.1	32.0	32.2	32.1	31.5	31.6	31.7	31.6
4	3.85	32.5	33.5	32.7	32.9	31.9	32.6	32.0	32.2
Center	5.96	32.6	31.8	32.1	32.2	31.7	31.6	31.4	31.6
5	8.07	31.2	31.8	31.3	31.4	32.0	32.1	31.4	31.8
6	9.61	31.2	30.3	31.0	30.8	32.0	31.5	30.9	31.5
7	10.67	30.8	29.9	30.8	30.5	31.7	31.9	30.6	31.4
8	11.42	30.8	30.2	31.1	30.7	31.3	31.8	32.2	31.8
Averages ---------->		31.8	31.8	31.9	31.8	31.6	31.6	31.4	31.5

All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	31.68		Mean	31.88	31.55	31.71
Min Point	30.50	-3.7%	Std. Dev.	1.01	0.41	0.76
Max Point	33.20	4.8%	COV as %	3.2	1.3	**2.4**

Avg. Conc. 31.660 ppm

Instuments Used:

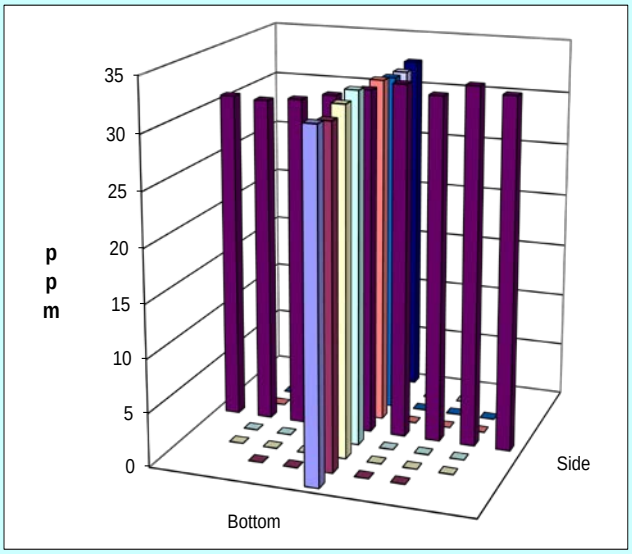
B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	650	650	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	65.3	73.1	°F
Mean stack velocity	3842	3857	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1008	1008	mbar
Ambient humidity	32%	27%	RH
Ambient Temp	66.2	72.2	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.4,.3,.3,.3,.3	.6,.6,.4,.4,.4	ppm
No. Bk-Gd samples	5	5	n

Gas analyzer checked: 5/28/2013

Notes: Mean Vel = Side 8

CA 5/30/13



Entries made by: Carmen Arimescu
Signature/date 5/30/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 7/17/2013
Signature on file with original TI-WTPSP-111

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-15**
Date	5/30/2013	Fan Configuration	**Fan A&B**
Testers	EA, CA	Fan Setting	**41** **Hz**
Stack Dia.	11.922 in.	Stack Temp	78.1 deg F
Stack X-Area	111.6 in.2	Start/End Time	130/1505
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2 Top**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	27.8	27.9	28.2	28.0	32.8	33.7	33.1	33.2
2	1.25	27.1	26.1	26.1	26.4	33.0	33.1	32.9	33.0
3	2.31	28.0	28.1	28.0	28.0	31.8	31.4	30.3	31.2
4	3.85	27.4	28.7	27.9	28.0	31.0	31.3	30.7	31.0
Center	5.96	28.3	28.9	29.4	28.9	29.9	30.1	29.9	30.0
5	8.07	29.8	30.1	30.3	30.1	28.3	28.3	28.5	28.4
6	9.61	32.0	31.3	32.0	31.8	25.3	26.8	26.1	26.1
7	10.67	32.3	32.4	32.7	32.5	25.3	24.7	26.2	25.4
8	11.42	32.3	32.7	32.8	32.6	24.7	24.8	23.6	24.4
Averages ---------->		29.4	29.6	29.7	29.6	29.1	29.4	29.0	29.2

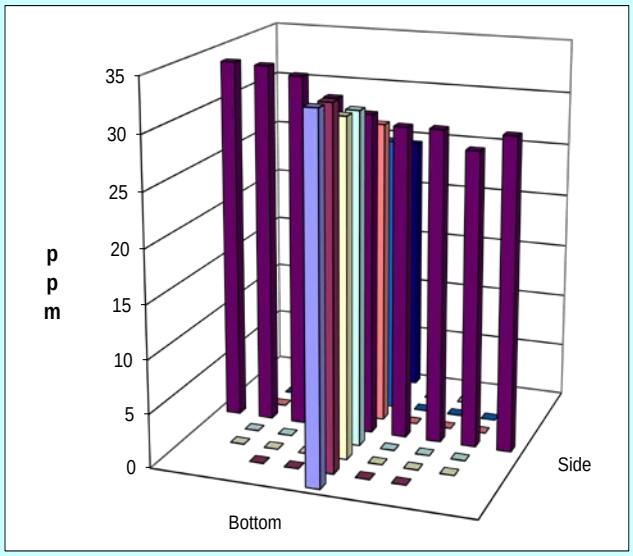
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	29.37		Mean	29.38	29.28	29.33
Min Point	24.37	-17.0%	Std. Dev.	2.17	2.80	2.41
Max Point	33.20	13.0%	COV as %	7.4	9.6	**8.2**

Avg. Conc. 29.369 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	700	700	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	76.7	79.5	°F
Mean stack velocity	3856	3822	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1009	1010	mbar
Ambient humidity	22%	23%	RH
Ambient Temp	83.3	77.9	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.4,.4,.4,.4,.4	.4,.3,.3,.4,.4	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 5/28/2013

Notes: Mean Vel = Bottom 8

CA 5/30/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	5/30/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-16**
Date	5/31/2013	Fan Configuration	**Fan A&B**
Testers	EA,CA	Fan Setting	**41** **Hz**
Stack Dia.	11.922 in.	Stack Temp	70.3 deg F
Stack X-Area	111.6 in.2	Start/End Time	857/1045
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2 Far Wall**

Order -->		2nd				1st				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	23.8	24.2	24.4	24.1	30.1	30.5	31.9	30.8
2	1.25	26.1	26.2	25.5	25.9	31.0	31.6	31.1	31.2
3	2.31	26.6	27.4	26.8	26.9	31.6	31.9	30.8	31.4
4	3.85	28.8	28.6	28.0	28.5	32.4	32.1	31.2	31.9
Center	5.96	31.1	30.6	30.1	30.6	32.3	31.7	30.7	31.6
5	8.07	32.9	33.0	32.9	32.9	30.7	30.2	29.4	30.1
6	9.61	32.7	33.8	34.0	33.5	27.9	27.9	27.8	27.9
7	10.67	33.7	34.2	34.2	34.0	26.0	26.3	26.3	26.2
8	11.42	35.8	34.8	32.7	34.4	25.7	25.6	26.1	25.8
Averages ---------->		30.2	30.3	29.8	30.1	29.7	29.8	29.5	29.7

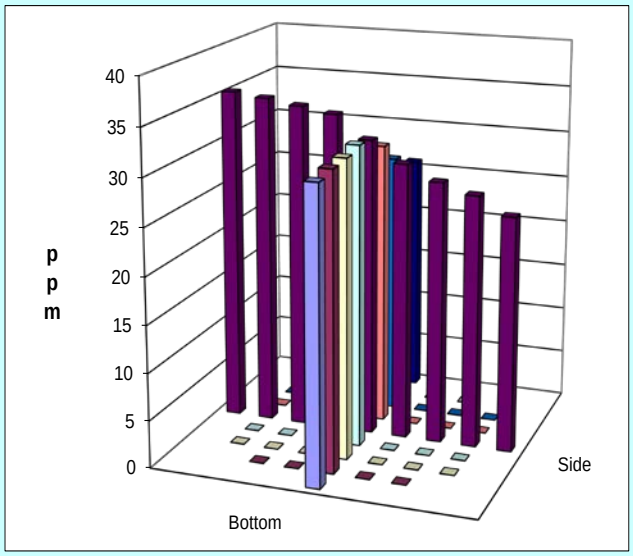
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	29.88		Mean	30.34	30.04	30.19
Min Point	24.13	-19.2%	Std. Dev.	3.29	2.18	2.69
Max Point	34.43	15.2%	COV as %	10.8	7.3	**8.9**

Avg. Conc. 29.733 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	700	700	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	69.2	71.4	°F
Mean stack velocity	3907	3955	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1018	1018	mbar
Ambient humidity	39%	32%	RH
Ambient Temp	62.6	69.8	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.4,.4,.4,.4,.4	.5,.4,.4,.3,.4	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 2/28/2013

Notes: Mean Vel = Bottom 8

Ca 5/31/13

Entries made by:	Carmen Arimescu
Signature/date	5/31/2013

Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-111	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-17**
Date	5/31/2013	Fan Configuration	**Fan A&B**
Testers	EA,CA	Fan Setting	**41** **Hz**
Stack Dia.	11.922 in.	Stack Temp	73.65 deg F
Stack X-Area	111.6 in.2	Start/End Time	1049/1213
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2 Near Wall**

Order -->		1st				2nd				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	ppm				ppm				
1	0.50	29.4	29.3	28.1	28.9	26.6	25.1	25.9	25.9	
2	1.25	30.0	30.0	29.7	29.9	26.8	26.9	27.2	27.0	
3	2.31	29.5	29.2	29.7	29.5	27.2	27.5	26.8	27.2	
4	3.85	29.1	28.9	29.3	29.1	27.7	27.3	26.7	27.2	
Center	5.96	28.7	28.8	27.8	28.4	29.1	28.7	29.0	28.9	
5	8.07	28.3	28.0	28.1	28.1	30.6	30.9	30.7	30.7	
6	9.61	28.2	28.8	27.0	28.0	31.5	31.5	32.5	31.8	
7	10.67	29.5	29.7	30.7	30.0	33.0	32.6	32.3	32.6	
8	11.42	29.0	29.5	29.7	29.4	32.6	32.3	32.6	32.5	
Averages ---------->		29.1	29.1	28.9	29.0	29.5	29.2	29.3	29.3	

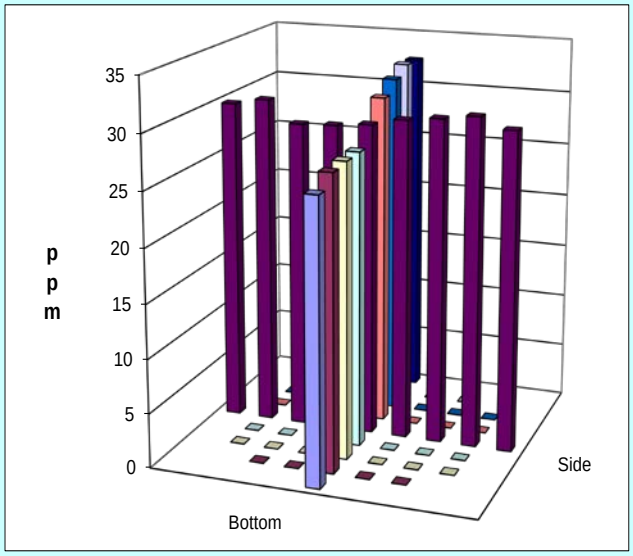
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	29.18		Mean	29.00	29.36	29.18
Min Point	25.87	-11.3%	Std. Dev.	0.82	2.38	1.72
Max Point	32.63	11.8%	COV as %	2.8	8.1	**5.9**

Avg. Conc. 29.240 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN	1804888	Cat2 M&TE
TSI VelociCalc	SN	T95351203001	12/10/2013
Fisher Scientific	SN	90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	700	700	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	71.4	75.9	°F
Mean stack velocity	3955	4090	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1018	1018	mbar
Ambient humidity	31%	29%	RH
Ambient Temp	70.7	72.5	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.5,.4,.4,.3,.4	.5,.4,.4,.4,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 2/28/2013

Notes: Mean Vel = Bottom 8

Ca 5/31/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	5/31/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-18**
Date	5/31/2013	Fan Configuration	**Fan A**
Testers	EA,CA	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	81.35 deg F
Stack X-Area	111.6 in.2	Start/End Time	110/245
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2 Near Wall**

Order -->		1st				2nd				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	30.8	30.5	30.8	30.7	35.0	34.3	34.0	34.4
2	1.25	31.1	31.1	30.9	31.0	32.4	32.6	33.2	32.7
3	2.31	30.9	31.3	31.3	31.2	32.5	32.7	32.9	32.7
4	3.85	30.2	30.6	30.7	30.5	32.6	31.9	30.8	31.8
Center	5.96	30.8	31.8	31.2	31.3	31.2	31.1	31.0	31.1
5	8.07	32.5	32.6	32.6	32.6	31.4	31.6	31.3	31.4
6	9.61	33.7	34.3	33.8	33.9	32.0	31.5	32.0	31.8
7	10.67	34.6	34.1	34.9	34.5	32.6	31.6	31.6	31.9
8	11.42	34.0	36.7	33.5	34.7	31.9	32.0	32.0	32.0
Averages ---------->		32.1	32.6	32.2	32.3	32.4	32.1	32.1	32.2

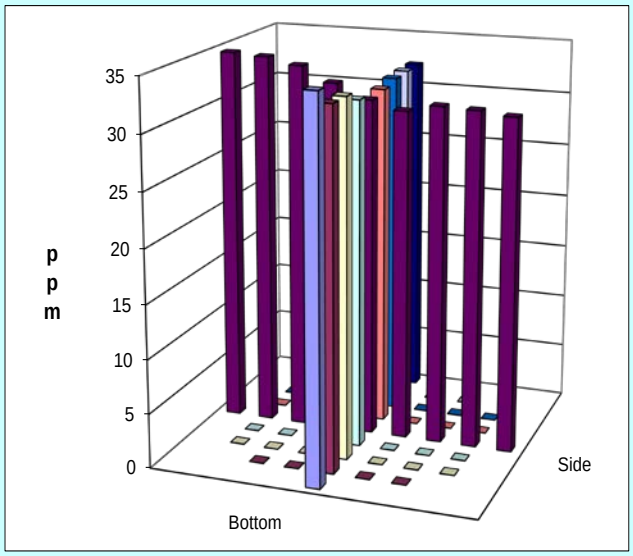
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	32.24		Mean	32.14	31.93	32.04
Min Point	30.50	-5.4%	Std. Dev.	1.57	0.61	1.15
Max Point	34.73	7.7%	COV as %	4.9	1.9	**3.6**

Avg. Conc. 32.373 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	700	700	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	81	81.7	°F
Mean stack velocity	3872	3869	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1018	1018	mbar
Ambient humidity	23%	24%	RH
Ambient Temp	80.6	77	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.4,.4,.4,.3,.3	.6,.4,.4,.4,.4	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 2/28/2013

Notes: Mean Vel= Side 8

Ca 5/31/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	5/31/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-19**
Date	6/3/2013	Fan Configuration	**Fan B**
Testers	EA,CA	Fan Setting	**28.4** **Hz**
Stack Dia.	11.922 in.	Stack Temp	78.25 deg F
Stack X-Area	111.6 in.2	Start/End Time	925/1103
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2 Near Wall**

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	32.0	31.7	32.7	32.1	29.8	30.3	29.7	29.9
2	1.25	32.0	30.8	32.2	31.7	29.9	29.7	28.9	29.5
3	2.31	30.8	30.2	32.1	31.0	29.3	29.1	29.4	29.3
4	3.85	30.8	29.2	31.7	30.6	29.2	29.0	28.9	29.0
Center	5.96	29.2	27.5	29.6	28.8	29.8	29.5	29.3	29.5
5	8.07	27.0	25.6	28.2	26.9	30.5	30.6	30.2	30.4
6	9.61	25.5	27.1	27.4	26.7	32.5	30.7	30.4	31.2
7	10.67	24.4	27.6	26.7	26.2	31.1	31.4	32.1	31.5
8	11.42	25.5	26.8	26.7	26.3	33.8	33.3	31.0	32.7
Averages ---------->		28.6	28.5	29.7	28.9	30.7	30.4	30.0	30.3

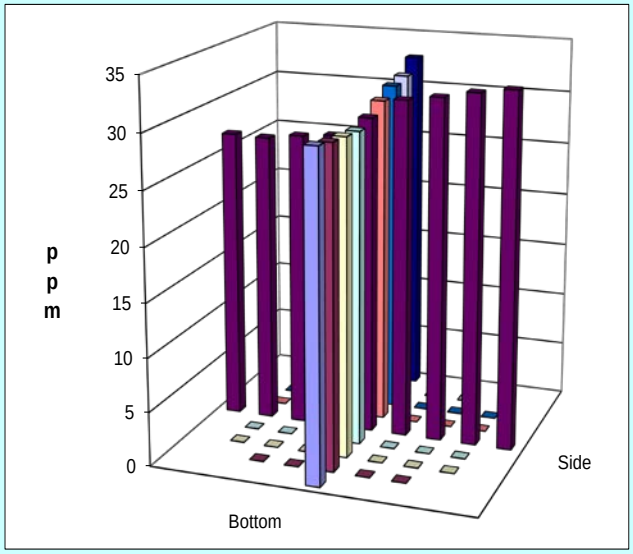
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	29.64		Mean	28.84	30.07	29.45
Min Point	26.23	-11.5%	Std. Dev.	2.27	0.99	1.80
Max Point	32.70	10.3%	COV as %	7.9	3.3	**6.1**

Avg. Conc. 29.698 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN	1804888	Cat2 M&TE
TSI VelociCalc	SN	T95351203001	12/10/2013
Fisher Scientific	SN	90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	700	720	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	76	80.5	°F
Mean stack velocity	1871	1874	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1014	1013	mbar
Ambient humidity	27%	28%	RH
Ambient Temp	77.9	75.2	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.4,.4,.4,.4,.4	.4,.3,.3,.3,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 6/3/2013

Notes: Mean Vel= Side Center

CA 6/3/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/3/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-20**
Date	6/3/2013	Fan Configuration	**Fan B**
Testers	EA,CA	Fan Setting	**27.4** **Hz**
Stack Dia.	11.922 in.	Stack Temp	82.65 deg F
Stack X-Area	111.6 in.2	Start/End Time	1105/1230
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2 Far**

		Side				Bottom			
Order -->		2nd				1st			
Traverse-->									
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	31.3	30.5	30.1	30.6	30.5	30.5	30.7	30.6
2	1.25	30.8	31.4	31.5	31.2	31.2	30.7	30.9	30.9
3	2.31	30.4	30.4	31.1	30.6	31.3	31.6	30.8	31.2
4	3.85	30.6	31.1	30.5	30.7	30.8	30.9	31.8	31.2
Center	5.96	31.1	31.2	31.5	31.3	31.6	31.6	31.4	31.5
5	8.07	31.6	31.6	31.7	31.6	30.6	31.0	30.8	30.8
6	9.61	31.3	31.5	30.1	31.0	30.4	31.5	30.7	30.9
7	10.67	31.2	30.5	29.9	30.5	31.4	31.7	31.1	31.4
8	11.42	29.6	30.0	29.7	29.8	32.0	30.5	31.5	31.3
Averages ---------->		30.9	30.9	30.7	30.8	31.1	31.1	31.1	31.1

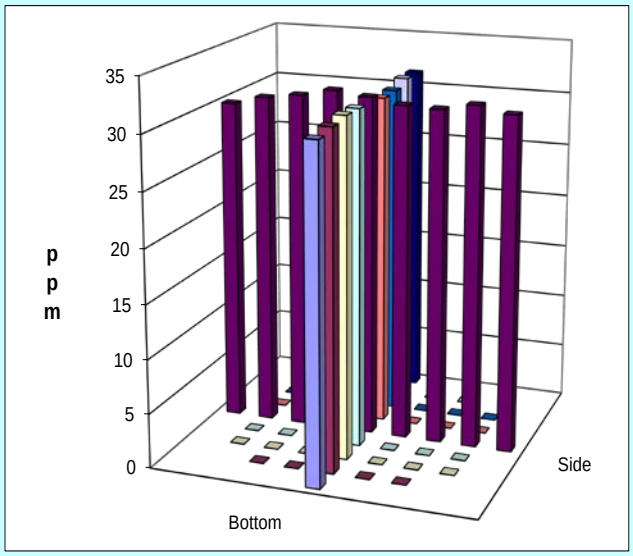
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	30.96		Mean	31.00	31.13	31.07
Min Point	29.77	-3.8%	Std. Dev.	0.40	0.28	0.34
Max Point	31.63	2.2%	COV as %	1.3	0.9	**1.1**

Avg. Conc. 30.902 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	750	790	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	80.8	84.5	°F
Mean stack velocity	1821	1831	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1013	1013	mbar
Ambient humidity	27%	23%	RH
Ambient Temp	77	79.7	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.3,.3,.3,.3,.3	.5,.4,.4,.3,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 6/3/2013

Notes: Mean Vel= Side Center

CA 6/3/13

Entries made by: Carmen Arimescu
Signature/date 6/3/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 7/17/2013
Signature on file with original TI-WTPSP-111

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-21**
Date	6/3/2013	Fan Configuration	**Fan A**
Testers	EA,CA	Fan Setting	**58.7** **Hz**
Stack Dia.	11.922 in.	Stack Temp	89.15 deg F
Stack X-Area	111.6 in.2	Start/End Time	138/1500
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2 Far**

Order -->		1st				2nd				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	ppm				ppm				
1	0.50	33.6	32.8	34.0	33.5	31.9	31.3	30.6	31.3	
2	1.25	33.8	33.8	32.7	33.4	31.5	31.0	30.0	30.8	
3	2.31	34.0	34.0	33.5	33.8	31.5	30.6	31.0	31.0	
4	3.85	34.3	33.5	33.4	33.7	32.0	31.3	30.9	31.4	
Center	5.96	33.6	32.9	32.8	33.1	32.2	31.7	32.0	32.0	
5	8.07	33.6	33.1	32.5	33.1	32.9	32.0	32.3	32.4	
6	9.61	32.4	32.2	31.6	32.1	33.2	32.0	32.3	32.5	
7	10.67	32.6	31.2	32.0	31.9	32.6	32.4	32.4	32.5	
8	11.42	33.3	32.1	31.9	32.4	33.0	32.6	31.9	32.5	
Averages ---------->		33.5	32.8	32.7	33.0	32.3	31.7	31.5	31.8	

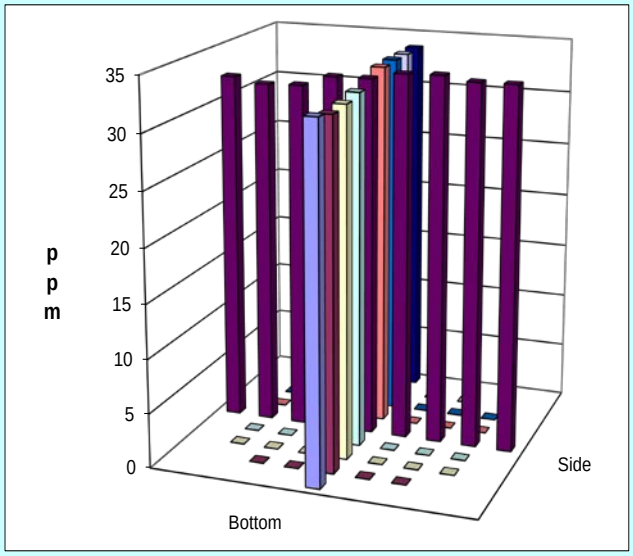
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	32.41		Mean	33.02	31.80	32.41
Min Point	30.83	-4.9%	Std. Dev.	0.76	0.71	0.95
Max Point	33.83	4.4%	COV as %	2.3	2.2	**2.9**

Avg. Conc. 32.398 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	800	810	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	88	90.3	°F
Mean stack velocity	3825	3793	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1013	1012	mbar
Ambient humidity	20%	20%	RH
Ambient Temp	86.9	86.0	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.4,.4,.4,.4,.4	.5,.4,.3,.3,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 6/3/2013

Notes: Mean Vel= Side 8

CA 6/3/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/3/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-22**
Date	6/4/2013	Fan Configuration	**Fan B**
Testers	JAG, CA	Fan Setting	**56** **Hz**
Stack Dia.	11.922 in.	Stack Temp	77.65 deg F
Stack X-Area	111.6 in.2	Start/End Time	925/1110
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	I2 Center

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	33.2	33.3	33.2	33.2	32.9	33.1	32.8	32.9
2	1.25	33.8	33.4	33.0	33.4	32.9	32.6	32.8	32.8
3	2.31	33.0	32.7	33.0	32.9	32.4	32.8	32.9	32.7
4	3.85	32.8	33.1	32.9	32.9	32.6	32.1	32.5	32.4
Center	5.96	32.3	32.8	32.1	32.4	33.2	32.4	32.5	32.7
5	8.07	32.1	32.1	32.0	32.1	33.5	33.4	32.7	33.2
6	9.61	31.8	31.9	31.8	31.8	33.5	33.9	33.2	33.5
7	10.67	31.9	31.9	30.8	31.5	34.1	34.3	33.5	34.0
8	11.42	30.9	31.7	31.3	31.3	34.3	34.3	33.5	34.0
Averages ---------->		32.4	32.5	32.2	32.4	33.3	33.2	32.9	33.1

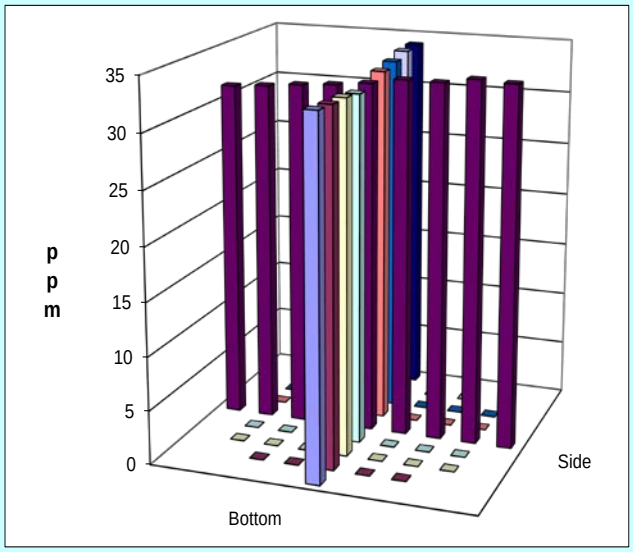
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	32.77		Mean	32.44	33.04	32.74
Min Point	31.30	-4.5%	Std. Dev.	0.67	0.55	0.67
Max Point	34.03	3.9%	COV as %	2.1	1.7	**2.0**

Avg. Conc. 32.796 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	700	800	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	75.2	80.1	°F
Mean stack velocity	4010	3916	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1017	1016	mbar
Ambient humidity	34%	30%	RH
Ambient Temp	73.4	77.9	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.3,.3,.3,.3,.4	.5,.4,.4,.4,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 6/3/2013

Notes: Mean Vel= Side Center

CA 6/4/13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/4/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-23**
Date	6/4/2013	Fan Configuration	**Fan A&B**
Testers	JAG, CA	Fan Setting	**21 Hz**
Stack Dia.	11.922 in.	Stack Temp	85.8 deg F
Stack X-Area	111.6 in.2	Start/End Time	1119/130
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	I2 Center

Order -->		1st				2nd				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	ppm				ppm				
1	0.50	29.9	29.4	28.7	29.3	31.9	32.8	32.8	32.5	
2	1.25	28.6	29.1	28.9	28.9	32.8	32.2	32.0	32.3	
3	2.31	26.9	28.2	28.4	27.8	31.1	30.8	29.9	30.6	
4	3.85	28.0	28.5	27.3	27.9	28.5	29.2	29.6	29.1	
Center	5.96	28.8	28.2	28.2	28.4	27.8	28.2	28.4	28.1	
5	8.07	29.4	28.8	30.1	29.4	27.4	26.2	25.6	26.4	
6	9.61	30.7	31.0	30.8	30.8	25.1	24.4	25.9	25.1	
7	10.67	32.0	31.4	31.0	31.5	24.5	25.5	24.2	24.7	
8	11.42	31.6	32.9	33.2	32.6	22.7	25.1	23.5	23.8	
Averages ---------->		29.5	29.7	29.6	29.6	28.0	28.3	28.0	28.1	

All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	28.85		Mean	29.25	28.06	28.66
Min Point	23.77	-17.6%	Std. Dev.	1.42	2.83	2.24
Max Point	32.57	12.9%	COV as %	4.8	10.1	**7.8**

Avg. Conc. 28.927 ppm

Instuments Used:

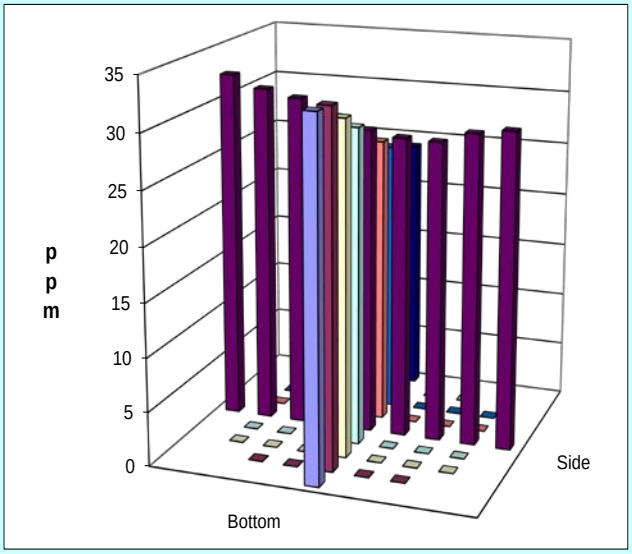
B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	800	800	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	83.9	87.7	°F
Mean stack velocity	1783	1846	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1016	1016	mbar
Ambient humidity	28%	23%	RH
Ambient Temp	79.7	84.2	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.3,.3,.3,.3,.3	.5,.4,.3,.3,.3	ppm
No. Bk-Gd samples	5	5	n

Gas analyzer checked: 6/3/2013

Notes: Mean Vel= Bottom 8

CA 6/4/13



Entries made by: Carmen Arimescu
Signature/date 6/4/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 7/17/2013
Signature on file with original TI-WTPSP-111

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-24**
Date	6/6/2013	Fan Configuration	**Fan A&B**
Testers	EA, CA	Fan Setting	**39.1** **Hz**
Stack Dia.	11.922 in.	Stack Temp	86 deg F
Stack X-Area	111.6 in.2	Start/End Time	900/1030
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2** Far Wall

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	28.4	27.7	30.1	28.7	31.2	29.7	30.6	30.5
2	1.25	30.1	29.6	29.9	29.9	33.0	31.7	32.5	32.4
3	2.31	32.3	31.8	30.7	31.6	34.8	34.0	33.2	34.0
4	3.85	33.6	33.0	33.2	33.3	34.7	35.1	34.1	34.6
Center	5.96	33.6	33.1	32.1	32.9	33.9	34.0	33.4	33.8
5	8.07	33.6	33.5	32.4	33.2	33.1	32.5	32.2	32.6
6	9.61	31.7	32.1	31.3	31.7	32.8	32.3	30.7	31.9
7	10.67	30.7	29.7	30.1	30.2	31.3	30.8	30.8	31.0
8	11.42	29.1	30.1	29.7	29.6	31.5	31.3	30.5	31.1
Averages ---------->		31.5	31.2	31.1	31.2	32.9	32.4	32.0	32.4

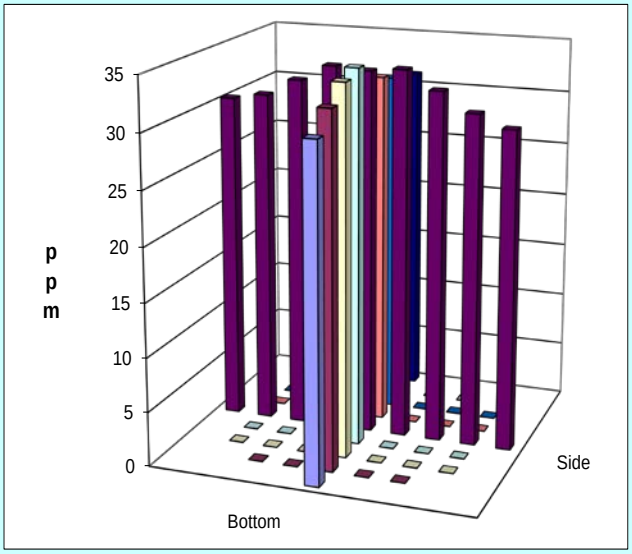
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	31.83		Mean	31.81	32.90	32.36
Min Point	28.73	-9.7%	Std. Dev.	1.40	1.29	1.41
Max Point	34.63	8.8%	COV as %	4.4	3.9	**4.4**

Avg. Conc. 31.642 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	800	850	psig
Injection flowmeter	3.4	3.4	slpm
Stack Temp	84.5	87.5	°F
Mean stack velocity	3845	3873	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1017	1016	mbar
Ambient humidity	29%	26%	RH
Ambient Temp	80.6	85.1	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.4,.4,.4,.3,.4	.5,.3,.3,.3,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 6/3/2013

Notes: The injection probe is 1 inch from the far wall.
Mean Vel = Bottom 8

CA 6/6/ 13

Entries made by: Carmen Arimescu
Signature/date 6/6/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 7/17/2013
Signature on file with original TI-WTPSP-111

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**GT-25**
Date	6/6/2013	Fan Configuration	**Fan A**
Testers	EA, CA	Fan Setting	**30** **Hz**
Stack Dia.	11.922 in.	Stack Temp	91.7 deg F
Stack X-Area	111.6 in.2	Start/End Time	1035/1215
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I2** Near Wall

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	23.4	22.3	23.5	23.1	25.4	25.8	25.8	25.7
2	1.25	24.0	22.6	23.7	23.4	26.7	24.4	27.1	26.1
3	2.31	22.9	24.1	23.6	23.5	25.8	25.3	25.9	25.7
4	3.85	24.4	24.3	24.2	24.3	25.0	24.3	25.8	25.0
Center	5.96	24.8	24.8	24.7	24.8	24.9	25.1	25.2	25.1
5	8.07	26.3	26.7	26.5	26.5	25.5	25.6	25.0	25.4
6	9.61	27.3	26.9	26.6	26.9	26.3	25.7	26.5	26.2
7	10.67	28.1	28.6	28.7	28.5	25.3	26.9	26.6	26.3
8	11.42	28.8	29.6	29.3	29.2	27.3	26.2	26.6	26.7
Averages ---------->		25.6	25.5	25.6	25.6	25.8	25.5	26.1	25.8

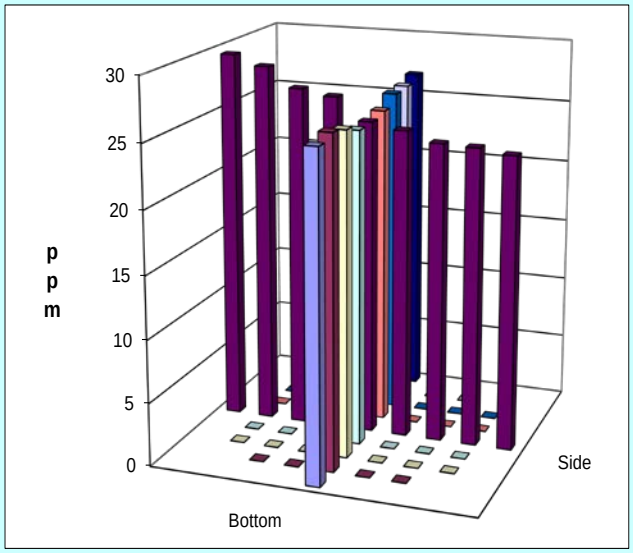
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	25.68		Mean	25.42	25.66	25.54
Min Point	23.07	-10.2%	Std. Dev.	1.91	0.52	1.35
Max Point	29.23	13.8%	COV as %	7.5	2.0	**5.3**

Avg. Conc. 25.775 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI VelociCalc	SN T95351203001	12/10/2013
Fisher Scientific	SN 90936818	12/11/2013

	Start	Finish	
Tracer tank pressure	850	880	psig
Injection flowmeter	1.4	1.4	slpm
Stack Temp	89.5	93.9	°F
Mean stack velocity	1817	1788	afpm
Sampling flowmeter	5	5	lpm
Ambient pressure	1016	1016	mbar
Ambient humidity	24%	22%	RH
Ambient Temp	86.9	87.8	°F
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.3,.3,.3,.3,.3	.5,.3,.3,.3,.3	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 6/3/2013

Notes: The injection probe is 1 inch from the far wall.
Mean Vel = Bottom 8

CA 6/6/ 13

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Elizabeth Golovich
Signature/date	6/6/2013	Signature/date	7/17/2013
		Signature on file with original TI-WTPSP-111	

B.6 LV-C2 Particle Tracer Uniformity Data Sheets

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-1**
Date	4/26/2013	Fan configuration	**Fan A**
Tester	EA, CA	Fan Setting	**60** **Hz**
Stack Dia.	11.922 in.	Stack Temp	85 deg F
Stack X-Area	111.6 in.2	Start/End Time	1000/1355
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I2**
Order ----->	2nd	1st	

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1905	2064	1866	1945.0	1311	1454	1322	1362.3
2	1.25	2280	2437	2041	2252.7	1918	1950	1908	1925.3
3	2.31	2420	2511	2351	2427.3	2217	2242	2175	2211.3
4	3.85	2330	2120	2404	2284.7	2632	2506	2473	2537.0
Center	5.96	2273	2031	2357	2220.3	2794	2838	2848	2826.7
5	8.07	2275	2052	2017	2114.7	2965	2852	2923	2913.3
6	9.61	2196	2016	1965	2059.0	2878	2973	3084	2978.3
7	10.67	2051	1869	1790	1903.3	2793	2841	2853	2829.0
8	11.42	1351	1014	1145	1170.0	1554	1478	1512	1514.7
Averages ---------->		2120.1	2012.7	1992.9	2041.9	2340.2	2348.2	2344.2	2344.2

All	pt/ft3	Dev. from mean
Mean	2193.1	
Min Point	1170.0	-46.6%
Max Point	2978.3	35.8%

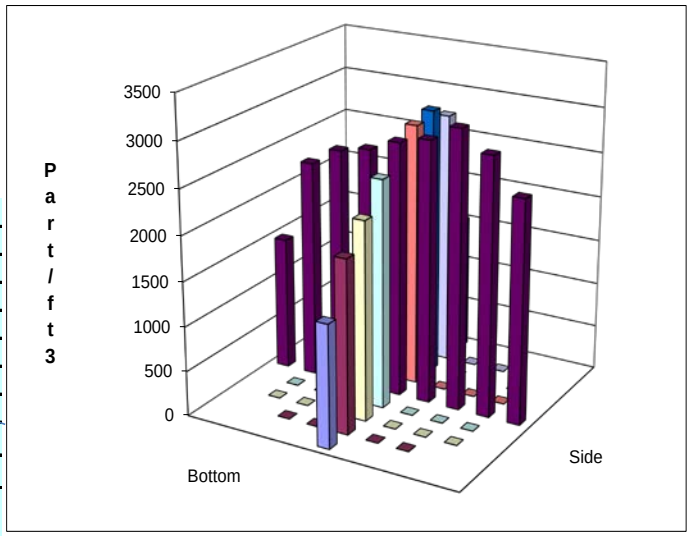
Center 2/3	Side	Top	All	Normlzd
Mean	2180.3	2603.0	2391.6	2689.34
Std. Dev.	170.5	399.0	367.4	321.35
COV as %	7.8	15.3	**15.4**	**11.95**

Avg Conc 2152 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.5	2.5	psig
Stack Temp	89	81	F
Mean Velocity	4042	3873	afpm
Ambient pressure	30.21	30.15	inHg
Ambient humidity	21%	17%	RH
Ambient temp	84.2	90	F
Back-Gd aerosol	14,49,28,24, 21	18, 8,11, 9,10	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	30	30	psig



Notes: Mean velocity measured at Side 8

CA 5/6/2013

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of Port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/6/2013

Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-2**
Date	4/30/2013	Fan configuration	**Fan A**
Tester	EA, CA	Fan Setting	**60 Hz**
Stack Dia.	11.922 in.	Stack Temp	57 deg F
Stack X-Area	111.6 in.2	Start/End Time	959/1143
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	2nd		1st

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1407	1337	1304	1349.3	1073	1288	1303	1221.3
2	1.25	1732	1700	1594	1675.3	1545	1721	1791	1685.7
3	2.31	1991	1877	1673	1847.0	1717	1933	1912	1854.0
4	3.85	1968	1833	1559	1786.7	1900	2104	2028	2010.7
Center	5.96	1976	1681	1455	1704.0	2081	2175	2204	2153.3
5	8.07	1651	1464	825	1313.3	2147	2226	2170	2181.0
6	9.61	1616	1338	1293	1415.7	2095	2162	2148	2135.0
7	10.67	1303	1430	1057	1263.3	1990	2068	1863	1973.7
8	11.42	903	1184	543	876.7	1153	1317	895	1121.7
Averages ---------->		1616.3	1538.2	1255.9	1470.1	1744.6	1888.2	1812.7	1815.1

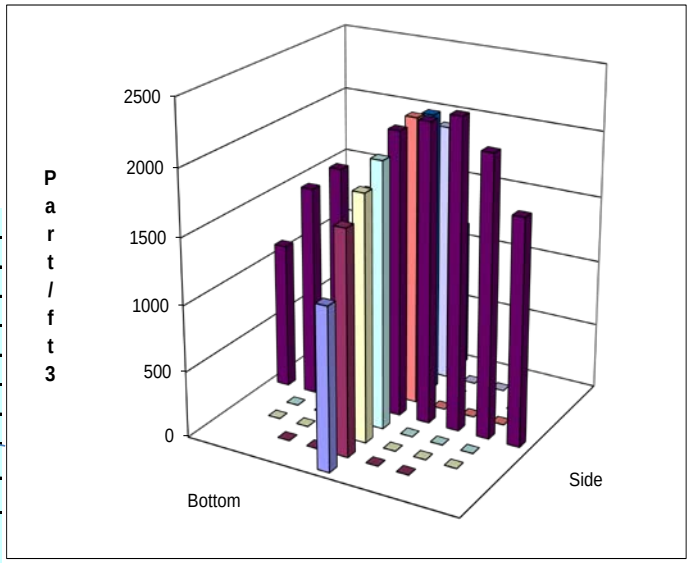
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Top	All	Normlzd
Mean	1642.6		Mean	1572.2	1999.0	1785.6	1992.91
Min Point	876.7	-46.6%	Std. Dev.	236.8	180.5	299.9	237.49
Max Point	2181.0	32.8%	COV as %	15.1	9.0	**16.8**	**11.92**

Avg Conc 1607 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.6	2.6	psig
Stack Temp	55	59	F
Mean Velocity	3968	3928	afpm
Ambient pressure	30.18	30.21	inHg
Ambient humidity	25%	25%	RH
Ambient temp	74.3	65.3	F
Back-Gd aerosol	17,22,18,22,16	7,14,10,17,9	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	30	30	psig



Notes: Mean velocity measured at Side 8
Fan A went off in the middle of testing.
We have to restart when we were at
point 4 and col. 2(side)

CA 4/30/13

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of Port 1

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 4/30/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 7/17/2013
Signature on file with original TI-WTPSP-110

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-3**
Date	5/1/2013	Fan configuration	**Fan A**
Tester	EA, CA	Fan Setting	**58** **Hz**
Stack Dia.	11.922 in.	Stack Temp	59 deg F
Stack X-Area	111.6 in.2	Start/End Time	845/1045
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	2nd		1st

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1430	1339	1413	1394.0	1114	1017	1214	1115.0
2	1.25	1662	1833	1867	1787.3	1350	1377	1448	1391.7
3	2.31	1782	1980	2029	1930.3	1491	1476	1639	1535.3
4	3.85	1882	1952	1959	1931.0	1667	1578	1779	1674.7
Center	5.96	1832	2040	1785	1885.7	1773	1762	1932	1822.3
5	8.07	1725	1826	1636	1729.0	1684	1766	1874	1774.7
6	9.61	1694	1800	1872	1788.7	1741	1809	1826	1792.0
7	10.67	1751	1663	1699	1704.3	1605	1658	1673	1645.3
8	11.42	1332	1555	1382	1423.0	815	738	757	770.0
Averages ---------->		1676.7	1776.4	1738.0	1730.4	1471.1	1464.6	1571.3	1502.3

All	pt/ft3	Dev. from mean
Mean	1616.4	
Min Point	770.0	-52.4%
Max Point	1931.0	19.5%

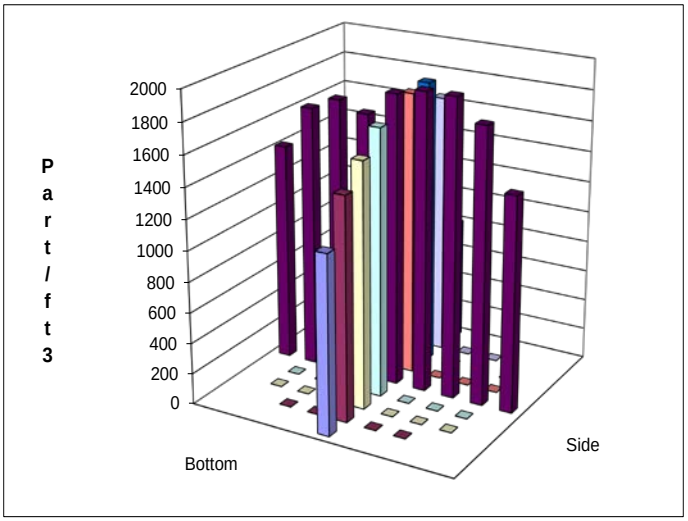
Center 2/3	Side	Top	All	Normlzd
Mean	1822.3	1662.3	1742.3	1771.20
Std. Dev.	93.5	155.4	148.6	137.06
COV as %	5.1	9.3	**8.5**	**7.74**

Avg Conc 1587 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.6	2.6	psig
Stack Temp	56	62	F
Mean Velocity	3907	3857	afpm
Ambient pressure	30.59	30.59	inHg
Ambient humidity	27%	25%	RH
Ambient temp	55.4	63.5	F
Back-Gd aerosol	6,6,17,9,13	6,5,4,2,18	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	30	30	psig



Notes: Mean vel. measured at Side 8

CA 5/1/13

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of port 1

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 5/1/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 7/17/2013
Signature on file with original TI-WTPSP-110

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-4**
Date	5/1/2013	Fan configuration	**Fan A**
Tester	EA, CA	Fan Setting	**28** **Hz**
Stack Dia.	11.922 in.	Stack Temp	66.25 deg F
Stack X-Area	111.6 in.2	Start/End Time	1048/1230
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	1st		2nd

		Side				Bottom			
Traverse-->									
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1878	1799	1741	1806.0	2168	2348	2385	2300.3
2	1.25	2077	2001	2163	2080.3	2323	2436	2507	2422.0
3	2.31	2159	2009	2109	2092.3	2467	2538	2536	2513.7
4	3.85	2240	1971	2106	2105.7	2502	2560	2568	2543.3
Center	5.96	2227	2056	2206	2163.0	2566	2697	2533	2598.7
5	8.07	2185	2062	2190	2145.7	2454	2623	2595	2557.3
6	9.61	2205	2176	2175	2185.3	2412	2516	2499	2475.7
7	10.67	2141	2091	2296	2176.0	2461	2490	2439	2463.3
8	11.42	2167	2009	2089	2088.3	2107	2011	2089	2069.0
Averages ---------->		2142.1	2019.3	2119.4	2093.6	2384.4	2468.8	2461.2	2438.1

All	pt/ft3	Dev. from mean
Mean	2265.9	
Min Point	1806.0	-20.3%
Max Point	2598.7	14.7%

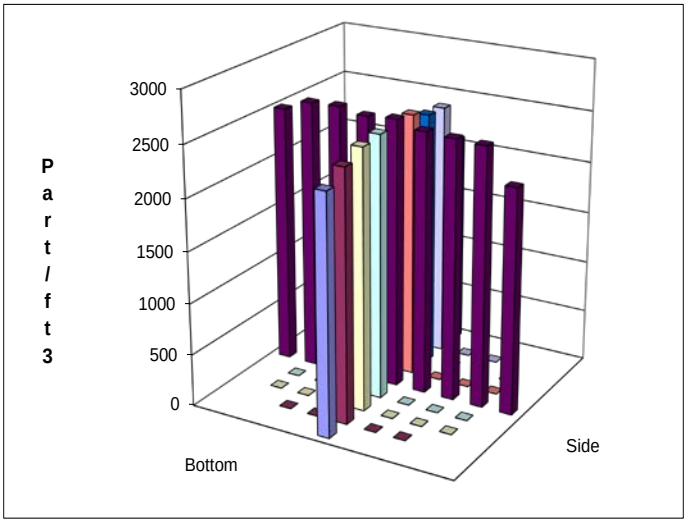
Center 2/3	Side	Top	All	Normlzd
Mean	2135.5	2510.6	2323.0	2538.09
Std. Dev.	42.4	61.0	201.1	61.07
COV as %	2.0	2.4	**8.7**	**2.41**

Avg Conc 2252 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	1.8	1.8	psig
Stack Temp	62	70.5	F
Mean Velocity	1857	1849	afpm
Ambient pressure	30.59	30.59	inHg
Ambient humidity	25%	22%	RH
Ambient temp	64.4	71.6	F
Back-Gd aerosol	3,1,1,3,0	3,4,1,6,1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	30	30	psig



Notes: Mean vel. measured at Side 8

CA 5/1/13

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/1/2013

Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-5**
Date	5/1/2013	Fan configuration	**Fan B**
Tester	EA, CA	Fan Setting	**57** **Hz**
Stack Dia.	11.922 in.	Stack Temp	72 deg F
Stack X-Area	111.6 in.2	Start/End Time	1340/1530
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	2nd		1st

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1014	1036	728	926.0	1669	1704	1743	1705.3
2	1.25	1292	1135	1092	1173.0	1930	1850	1774	1851.3
3	2.31	1497	1236	1247	1326.7	2030	1838	1889	1919.0
4	3.85	1438	1538	1469	1481.7	2192	2025	1913	2043.3
Center	5.96	1627	1611	1727	1655.0	1998	1869	1874	1913.7
5	8.07	1737	1719	1794	1750.0	1432	1288	1337	1352.3
6	9.61	1825	1675	1700	1733.3	1033	1052	1100	1061.7
7	10.67	1720	1548	1649	1639.0	832	818	885	845.0
8	11.42	1025	1022	1316	1121.0	371	403	420	398.0
Averages ---------->		1463.9	1391.1	1413.6	1422.9	1498.6	1427.4	1437.2	1454.4

All	pt/ft3	Dev. from mean
Mean	1438.6	
Min Point	398.0	-72.3%
Max Point	2043.3	42.0%

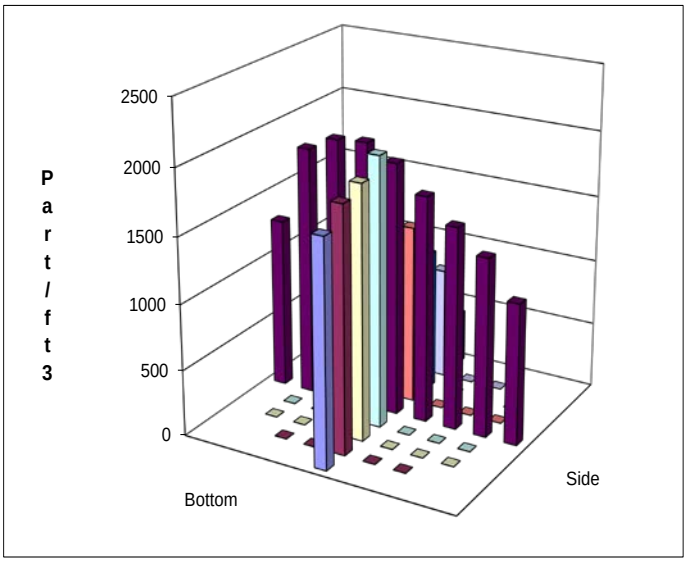
Center 2/3	Side	Top	All	Normlzd
Mean	1537.0	1569.5	1553.2	1673.32
Std. Dev.	219.1	478.6	358.0	383.37
COV as %	14.3	30.5	**23.0**	**22.91**

Avg Conc 1395 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.6	2.6	psig
Stack Temp	72	72	F
Mean Velocity	3937	3954	afpm
Ambient pressure	30.59	30.56	inHg
Ambient humidity	23%	24%	RH
Ambient temp	67.1	67.1	F
Back-Gd aerosol	17,25,19,27, 22	13,19,11,16, 11	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	30	30	psig



Notes: Mean vel. measured at Side Center point

CA 5/1/13

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/1/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-6**
Date	5/2/2013	Fan configuration	**Fan B**
Tester	EA, CA	Fan Setting	**27.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	59.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	845/1030
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	2nd		1st

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1020	1166	1232	1139.3	1391	1659	1851	1633.7
2	1.25	1246	1247	1329	1274.0	1743	1757	1832	1777.3
3	2.31	1310	1343	1407	1353.3	1793	1792	1880	1821.7
4	3.85	1470	1581	1692	1581.0	1804	1836	1961	1867.0
Center	5.96	1702	1701	1838	1747.0	1816	1804	1912	1844.0
5	8.07	1772	1744	1957	1824.3	1503	1609	1641	1584.3
6	9.61	1833	1914	1996	1914.3	1408	1483	1500	1463.7
7	10.67	1778	1887	2011	1892.0	1411	1384	1468	1421.0
8	11.42	1655	1655	1900	1736.7	1211	1262	1226	1233.0
Averages ---------->		1531.8	1582.0	1706.9	1606.9	1564.4	1620.7	1696.8	1627.3

All	pt/ft3	Dev. from mean
Mean	1617.1	
Min Point	1139.3	-29.5%
Max Point	1914.3	18.4%

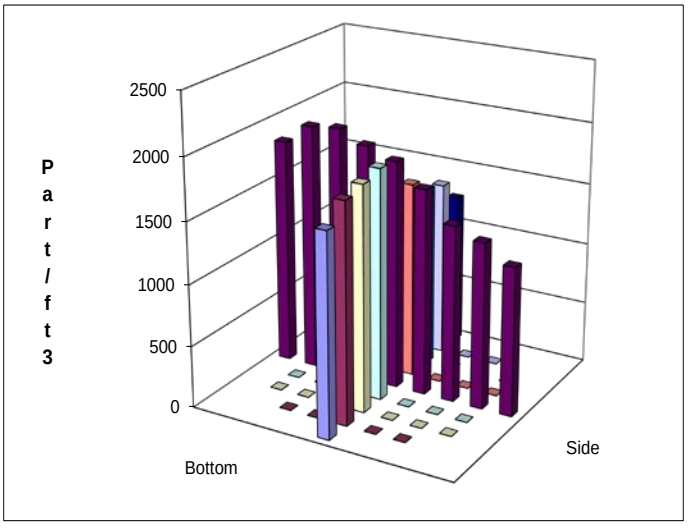
Center 2/3	Side	Top	All	Normlzd
Mean	1655.1	1682.7	1668.9	1714.88
Std. Dev.	258.9	189.0	218.3	228.20
COV as %	15.6	11.2	**13.1**	**13.31**

Avg Conc 1595 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	1.8	1.8	psig
Stack Temp	56	63	F
Mean Velocity	1830	1791	afpm
Ambient pressure	30.56	30.53	inHg
Ambient humidity	23%	26%	RH
Ambient temp	71.6	68.3	F
Back-Gd aerosol	7,8,4,5,6	8,7,7,6,8	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	30	30	psig



Notes: Mean vel. measured at Side Center point

CA 5/2/13

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/2/2013

Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-7**
Date	5/2/2013	Fan configuration	**Fan B**
Tester	EA, CA	Fan Setting	**27.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	79 deg F
Stack X-Area	111.6 in.2	Start/End Time	1300/230
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	2nd		1st

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1907	2005	2102	2004.7	2423	2630	2584	2545.7
2	1.25	1902	2062	2178	2047.3	2610	2659	2637	2635.3
3	2.31	2046	2237	2239	2174.0	2702	2681	2747	2710.0
4	3.85	2127	2012	2233	2124.0	2628	2750	2742	2706.7
Center	5.96	2249	2507	2354	2370.0	2658	2706	2754	2706.0
5	8.07	2292	2517	2371	2393.3	2363	2350	2456	2389.7
6	9.61	2377	2498	2475	2450.0	2255	2270	2310	2278.3
7	10.67	2339	2591	2567	2499.0	2328	2230	2385	2314.3
8	11.42	2123	2208	2508	2279.7	1924	1857	1901	1894.0
Averages ---------->		2151.3	2293.0	2336.3	2260.2	2432.3	2459.2	2501.8	2464.4

All	pt/ft3	Dev. from mean
Mean	2362.3	
Min Point	1894.0	-19.8%
Max Point	2710.0	14.7%

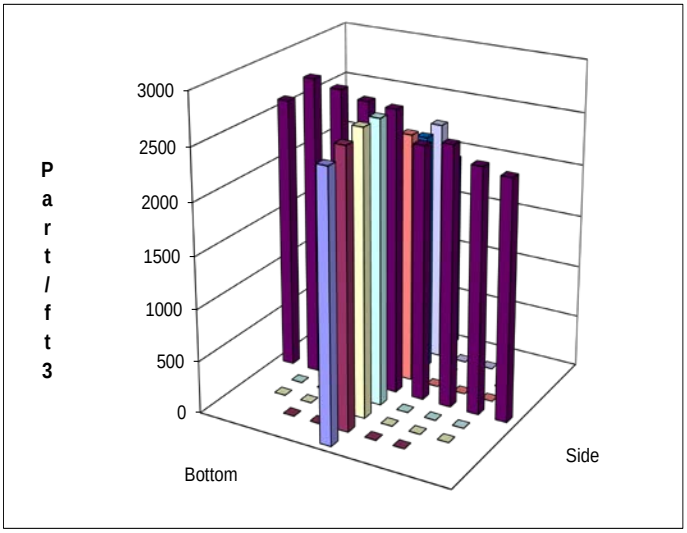
Center 2/3	Side	Top	All	Normlzd
Mean	2294.0	2534.3	2414.1	2576.75
Std. Dev.	176.1	197.9	219.0	196.69
COV as %	7.7	7.8	**9.1**	**7.63**

Avg Conc 2340 pt/ft3

Instuments Used: Cal. Due

TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	1.8	1.8	psig
Stack Temp	77	81	F
Mean Velocity	1773	1832	afpm
Ambient pressure	30.5	30.47	inHg
Ambient humidity	20%	20%	RH
Ambient temp	88.7	84.2	F
Back-Gd aerosol	10,13,2,6,2	9,5,11,11,5	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	30	30	psig



Notes: Mean vel. measured at Side Center point

CA 5/2/13

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of port 1

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 5/2/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 7/17/2013
Signature on file with original TI-WTPSP-110

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-8**
Date	5/2/2013	Fan configuration	**Fan B**
Tester	EA, CA	Fan Setting	**27.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	81.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	235/405
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	1st		2nd

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1721	1745	1845	1770.3	2956	2872	2781	2869.7
2	1.25	1836	1838	1903	1859.0	3095	2825	2856	2925.3
3	2.31	1864	1799	1942	1868.3	3131	2805	2953	2963.0
4	3.85	2199	2085	2125	2136.3	3061	2943	3007	3003.7
Center	5.96	2466	2273	2363	2367.3	3117	2800	2831	2916.0
5	8.07	2486	2356	2537	2459.7	2672	2313	2479	2488.0
6	9.61	2587	2425	2644	2552.0	2336	2056	2100	2164.0
7	10.67	2541	2517	2663	2573.7	2140	1817	1836	1931.0
8	11.42	2245	2544	2576	2455.0	1421	1242	1487	1383.3
Averages ---------->		2216.1	2175.8	2288.7	2226.9	2658.8	2408.1	2481.1	2516.0

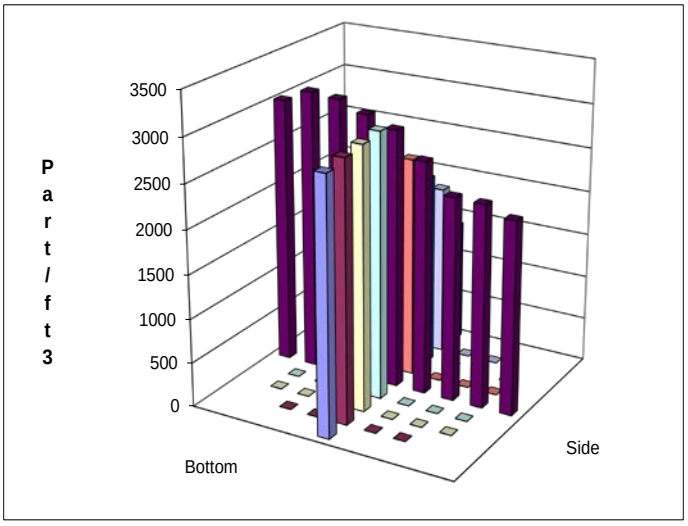
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Top	All	Normlzd
Mean	2371.4		Mean	2259.5	2627.3	2443.4	2705.22
Min Point	1383.3	-41.7%	Std. Dev.	306.7	436.9	409.8	400.67
Max Point	3003.7	26.7%	COV as %	13.6	16.6	**16.8**	**14.81**

Avg Conc 2338 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	1.8	1.8	psig
Stack Temp	81	82	F
Mean Velocity	1832	1760	afpm
Ambient pressure	30.7	30.42	inHg
Ambient humidity	20%	18%	RH
Ambient temp	84.2	89.6	F
Back-Gd aerosol	9,5,11,11,5	8,3,6,7,5	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	30	30	psig



Notes: Mean vel. measured at Side Center point

CA 5/2/13

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/2/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-9**
Date	5/6/2013	Fan configuration	**Fan B**
Tester	EA, CA	Fan Setting	**57** **Hz**
Stack Dia.	11.922 in.	Stack Temp	78 deg F
Stack X-Area	111.6 in.2	Start/End Time	830/1030
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	2nd		1st

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1075	1058	1428	1187.0	1168	1242	1002	1137.3
2	1.25	1588	1346	1801	1578.3	1668	1575	1454	1565.7
3	2.31	1363	1579	1737	1559.7	1681	1741	1472	1631.3
4	3.85	1777	1563	1946	1762.0	1774	1733	1539	1682.0
Center	5.96	1968	1767	2239	1991.3	1633	1521	1392	1515.3
5	8.07	1870	1949	2048	1955.7	1034	1034	824	964.0
6	9.61	1881	2010	2032	1974.3	658	604	483	581.7
7	10.67	1744	1914	2006	1888.0	402	349	284	345.0
8	11.42	803	1070	1137	1003.3	195	169	138	167.3
Averages ---------->		1563.2	1584.0	1819.3	1655.5	1134.8	1107.6	954.2	1065.5

All	pt/ft3	Dev. from mean
Mean	1360.5	
Min Point	167.3	-87.7%
Max Point	1991.3	46.4%

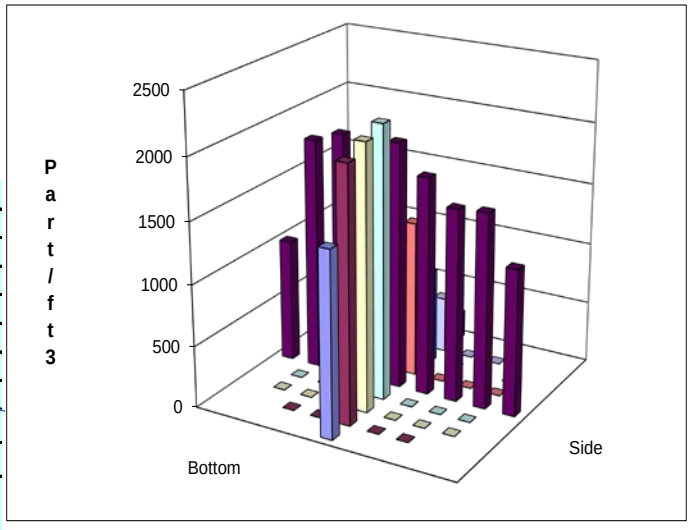
Center 2/3	Side	Top	All	Normlzd
Mean	1815.6	1183.6	1499.6	1685.49
Std. Dev.	185.1	550.6	513.1	525.02
COV as %	10.2	46.5	**34.2**	**31.15**

Avg Conc 1311 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.7	2.7	psig
Stack Temp	73	83	F
Mean Velocity	3877	3865	afpm
Ambient pressure	29.88	29.88	inHg
Ambient humidity	22%	20%	RH
Ambient temp	78.8	84	F
Back-Gd aerosol	16,18,13,13	8,15,11,12	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	30	psig



Notes: Mean velocity measured at Side Center

CA 5/6/2013

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of Port 1

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 5/6/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 7/17/2013
Signature on file with original TI-WTPSP-110

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-10**
Date	5/6/2013	Fan configuration	**Fan A&B**
Tester	EA, CA	Fan Setting	**40** **Hz**
Stack Dia.	11.922 in.	Stack Temp	85.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	1030/1220
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	1st		2nd

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	2082	2096	2019	2065.7	2467	2863	2889	2739.7
2	1.25	2211	2813	2222	2415.3	3709	3808	3838	3785.0
3	2.31	2525	2961	2750	2745.3	3881	3957	3979	3939.0
4	3.85	2517	2958	2705	2726.7	3548	3526	3625	3566.3
Center	5.96	2785	2674	2907	2788.7	3104	3167	3244	3171.7
5	8.07	2927	3165	3250	3114.0	2831	2806	2820	2819.0
6	9.61	3176	3139	3226	3180.3	2467	2448	2470	2461.7
7	10.67	2755	2860	2862	2825.7	1958	2079	2130	2055.7
8	11.42	1290	1522	2153	1655.0	1049	975	1053	1025.7
Averages ---------->		2474.2	2687.6	2677.1	2613.0	2779.3	2847.7	2894.2	2840.4

All	pt/ft3	Dev. from mean
Mean	2726.7	
Min Point	1025.7	-62.4%
Max Point	3939.0	44.5%

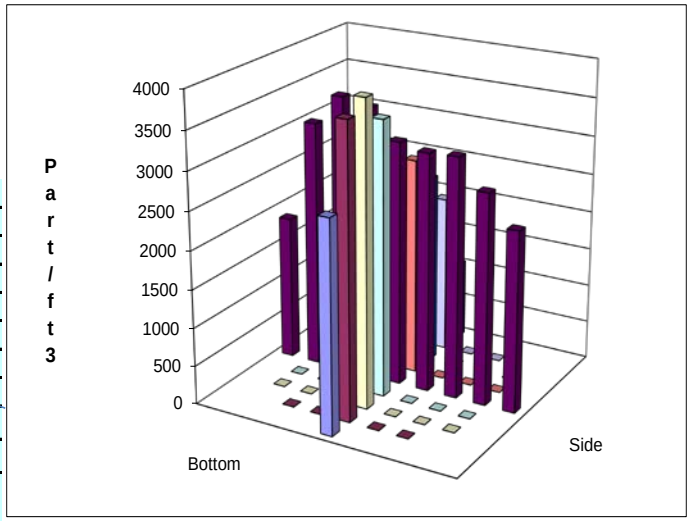
Center 2/3	Side	Top	All	Normlzd
Mean	2828.0	3114.0	2971.0	3165.22
Std. Dev.	256.5	703.7	530.1	520.27
COV as %	9.1	22.6	**17.8**	**16.44**

Avg Conc 2695 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.5	2.5	psig
Stack Temp	83	88	F
Mean Velocity	3857	3632	afpm
Ambient pressure	29.88	29.88	inHg
Ambient humidity	22%	21%	RH
Ambient temp	78.8	82.4	F
Back-Gd aerosol	4,4,5,6	4,11,9,4	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	30	psig



Notes: Mean velocity measured at Bottom 8

CA 5/6/2013

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of Port 1

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 5/6/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 7/17/2013
Signature on file with original TI-WTPSP-110

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-11**
Date	5/6/2013	Fan configuration	**Fan A&B**
Tester	EA, CA	Fan Setting	**21.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	95.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	145/345
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	2nd		1st

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1349	1329	1363	1347.0	1781	1942	1919	1880.7
2	1.25	1552	1628	1484	1554.7	1933	2029	2079	2013.7
3	2.31	1743	1577	1512	1610.7	1826	1917	2015	1919.3
4	3.85	1372	1576	1584	1510.7	1705	1716	1765	1728.7
Center	5.96	1597	1525	1484	1535.3	1534	1546	1612	1564.0
5	8.07	1532	1660	1617	1603.0	1454	1342	1465	1420.3
6	9.61	1739	1808	1657	1734.7	1413	1355	1380	1382.7
7	10.67	1771	1850	1758	1793.0	1223	1207	1325	1251.7
8	11.42	1695	1452	1746	1631.0	1033	1125	1101	1086.3
Averages ---------->		1594.4	1600.6	1578.3	1591.1	1544.7	1575.4	1629.0	1583.0

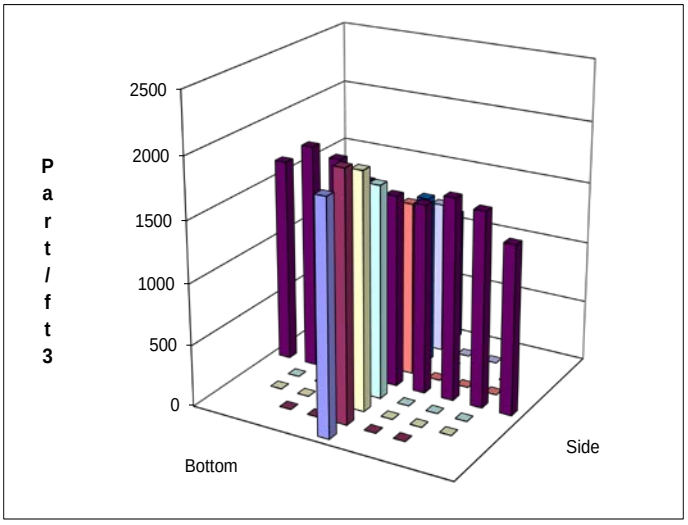
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Top	All	Normlzd
Mean	1587.1		Mean	1620.3	1611.5	1615.9	1631.01
Min Point	1086.3	-31.6%	Std. Dev.	105.5	286.0	207.2	208.58
Max Point	2013.7	26.9%	COV as %	6.5	17.7	**12.8**	**12.79**

Avg Conc 1592 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	1.0	1	psig
Stack Temp	95	96	F
Mean Velocity	1758	1709	afpm
Ambient pressure	29.83	29.8	inHg
Ambient humidity	20%	19%	RH
Ambient temp	87.8	89	F
Back-Gd aerosol	6,2,5,6	2,3,3,4	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	30	psig



Notes: Mean vel. Measured at bottom 8.
The wind is from north into the ref. port.

CA 5/6/2013

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/6/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-12**
Date	5/7/2013	Fan configuration	**Fan B&A**
Tester	EA, CA	Fan Setting	**21.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	80 deg F
Stack X-Area	111.6 in.2	Start/End Time	835/1024
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	I2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	2nd		1st

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1508	1495	1517	1506.7	2040	2110	2178	2109.3
2	1.25	1678	1625	1778	1693.7	2135	2336	2420	2297.0
3	2.31	1586	1667	1832	1695.0	2153	2230	2337	2240.0
4	3.85	1722	1578	1727	1675.7	1850	2007	2032	1963.0
Center	5.96	1679	1639	1728	1682.0	1761	1793	1770	1774.7
5	8.07	2073	1939	1998	2003.3	1528	1539	1589	1552.0
6	9.61	2412	2113	2075	2200.0	1494	1347	1459	1433.3
7	10.67	2481	2274	2374	2376.3	1293	1270	1400	1321.0
8	11.42	2287	2186	2052	2175.0	1018	1014	1222	1084.7
Averages ---------->		1936.2	1835.1	1897.9	1889.7	1696.9	1738.4	1823.0	1752.8

All	pt/ft3	Dev. from mean
Mean	1821.3	
Min Point	1084.7	-40.4%
Max Point	2376.3	30.5%

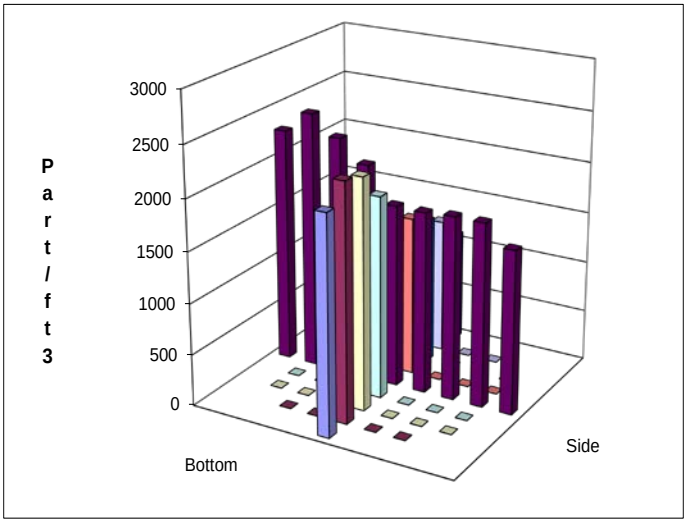
Center 2/3	Side	Top	All	Normlzd
Mean	1903.7	1797.3	1850.5	1902.94
Std. Dev.	291.5	385.8	333.1	352.69
COV as %	15.3	21.5	**18.0**	**18.53**

Avg Conc 1833 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	1.5	1.5	psig
Stack Temp	75	85	F
Mean Velocity	1711	1808	afpm
Ambient pressure	29.83	29.85	inHg
Ambient humidity	23%	24%	RH
Ambient temp	80.6	82.4	F
Back-Gd aerosol	14,11,13,13	14,13,5,14	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	30	psig



Notes: Mean vel. Measured at bottom 8.

CA 5/7/2013

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/7/2013

Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-13**
Date	5/7/2013	Fan configuration	**Fan A&B**
Tester	EA, CA	Fan Setting	**21.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	87.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	1030/1145
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	1st		2nd

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1393	1104	1542	1346.3	2174	2047	2241	2154.0
2	1.25	1506	1191	1771	1489.3	2275	2227	2272	2258.0
3	2.31	1549	1227	1739	1505.0	2182	2196	2327	2235.0
4	3.85	1504	1407	1790	1567.0	1878	1952	2154	1994.7
Center	5.96	1550	1753	1740	1681.0	1694	1770	1786	1750.0
5	8.07	1861	2118	1986	1988.3	1597	1631	1616	1614.7
6	9.61	2136	2310	2381	2275.7	1548	1483	1555	1528.7
7	10.67	2378	2507	2614	2499.7	1486	1393	1381	1420.0
8	11.42	2500	2457	2607	2521.3	1180	1218	1321	1239.7
Averages ---------->		1819.7	1786.0	2018.9	1874.9	1779.3	1768.6	1850.3	1799.4

All	pt/ft3	Dev. from mean
Mean	1837.1	
Min Point	1239.7	-32.5%
Max Point	2521.3	37.2%

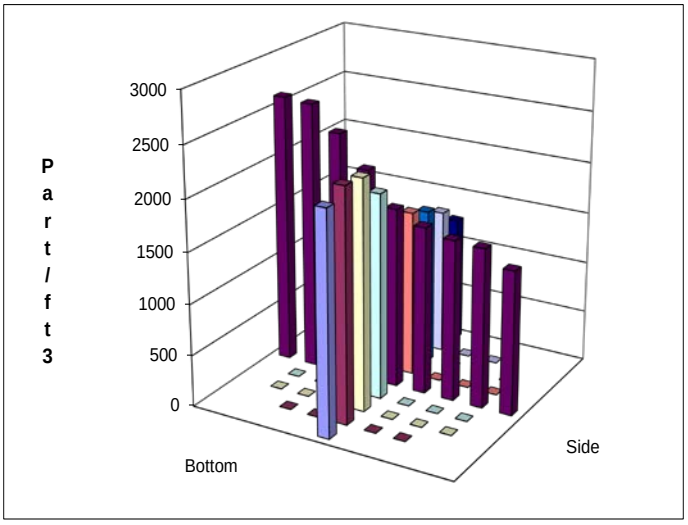
Center 2/3	Side	Top	All	Normlzd
Mean	1858.0	1828.7	1843.4	1881.49
Std. Dev.	404.1	338.1	358.3	370.73
COV as %	21.7	18.5	**19.4**	**19.70**

Avg Conc 1852 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	1.5	1.5	psig
Stack Temp	85	90	F
Mean Velocity	1808	1853	afpm
Ambient pressure	29.85	29.85	inHg
Ambient humidity	24%	22%	RH
Ambient temp	82.4	83.3	F
Back-Gd aerosol	14,13,5,14	9,7,5,12	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	30	psig



Notes: Mean vel. Measured at bottom 8.

CA 5/7/2013

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/7/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-14**
Date	5/8/2013	Fan configuration	**Fan B**
Tester	EA, CA	Fan Setting	**55** **Hz**
Stack Dia.	11.922 in.	Stack Temp	88.7 deg F
Stack X-Area	111.6 in.2	Start/End Time	11:00/13:24
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I3
Order ----->	2nd		1st

		Side				Bottom			
Traverse-->									
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1416	1391	1285	1364.0	1898	1870	1840	1869.3
2	1.25	1489	1530	1387	1468.7	2074	2039	2025	2046.0
3	2.31	1461	1501	1516	1492.7	2067	2066	1923	2018.7
4	3.85	1685	1497	1666	1616.0	2123	2031	1899	2017.7
Center	5.96	1972	2017	1991	1993.3	1858	1832	1648	1779.3
5	8.07	1868	2032	2025	1975.0	1360	1295	1142	1265.7
6	9.61	1695	1999	1796	1830.0	937	1025	822	928.0
7	10.67	1417	1730	1690	1612.3	573	646	546	588.3
8	11.42	1156	1543	1634	1444.3	432	380	236	349.3
Averages ---------->		1573.2	1693.3	1665.6	1644.0	1480.2	1464.9	1342.3	1429.1

All	pt/ft3	Dev. from mean
Mean	1536.6	
Min Point	349.3	-77.3%
Max Point	2046.0	33.2%

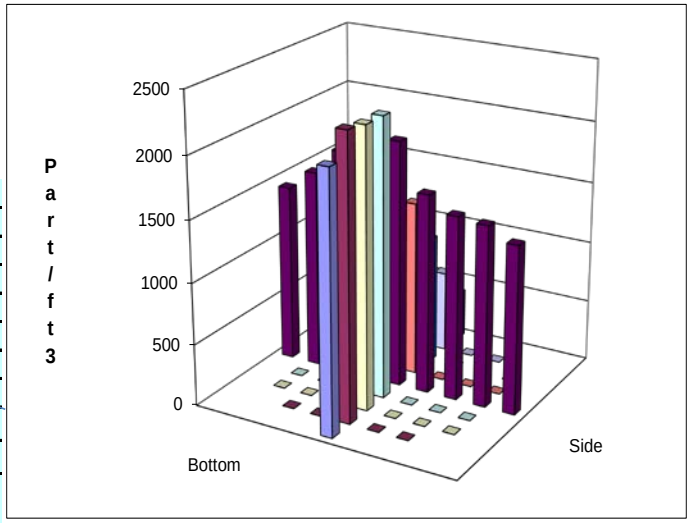
Center 2/3	Side	Top	All	Normlzd
Mean	1712.6	1520.5	1616.5	1707.98
Std. Dev.	219.4	594.9	442.1	476.68
COV as %	12.8	39.1	**27.4**	**27.91**

Avg Conc 1493 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.5	2.5	psig
Stack Temp	86.4	91	F
Mean Velocity	3905	3621	afpm
Ambient pressure	29.97	29.97	inHg
Ambient humidity	29%	25%	RH
Ambient temp	82.4	84.2	F
Back-Gd aerosol	13,13,11,16	12,8,10,4	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	30	psig



Notes: Mean velocity measured at Side Center

CA 5/8/2013

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of Port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/8/2013

Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT- 15**
Date	5/9/2013	Fan configuration	**Fan A**
Tester	EA, CA	Fan Setting	**58.6** **Hz**
Stack Dia.	11.922 in.	Stack Temp	87.9 deg F
Stack X-Area	111.6 in.2	Start/End Time	1000/1230
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I4
Order ----->	2nd		1st

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1322	1627	1466	1471.7	1167	1177	1285	1209.7
2	1.25	1916	2065	1791	1924.0	1511	1471	1466	1482.7
3	2.31	1970	1940	1859	1923.0	1560	1581	1664	1601.7
4	3.85	1869	1859	1956	1894.7	1728	1818	1799	1781.7
Center	5.96	1751	1664	1710	1708.3	1895	2074	2049	2006.0
5	8.07	1521	1441	1802	1588.0	2046	2068	2111	2075.0
6	9.61	1348	1355	1856	1519.7	2122	2094	2083	2099.7
7	10.67	1438	1324	1568	1443.3	1922	1985	1939	1948.7
8	11.42	1328	1496	1448	1424.0	1191	1217	1057	1155.0
Averages ---------->		1607.0	1641.2	1717.3	1655.2	1682.4	1720.6	1717.0	1706.7

All	pt/ft3	Dev. from mean
Mean	1680.9	
Min Point	1155.0	-31.3%
Max Point	2099.7	24.9%

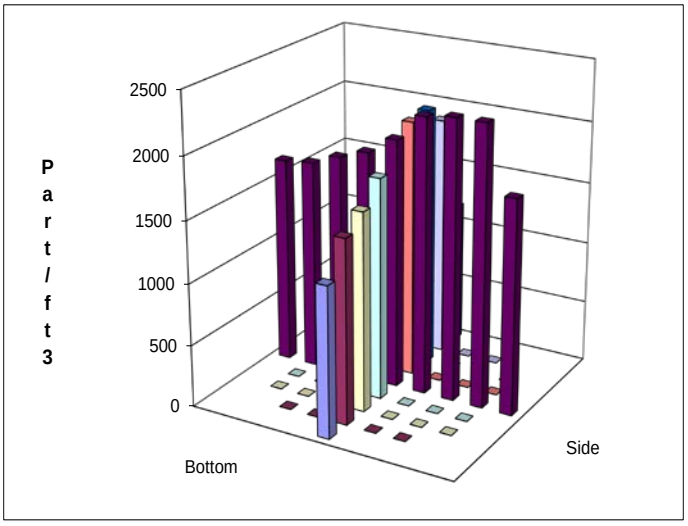
Center 2/3	Side	Top	All	Normlzd
Mean	1714.4	1856.5	1785.5	1934.82
Std. Dev.	203.0	240.8	226.3	244.16
COV as %	11.8	13.0	**12.7**	**12.62**

Avg Conc 1659 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.5	2.5	psig
Stack Temp	85.3	90.5	F
Mean Velocity	3768	3733	afpm
Ambient pressure	30.03	30.09	inHg
Ambient humidity	31%	23%	RH
Ambient temp	77.9	84.2	F
Back-Gd aerosol	10,14,4,7	7,10,8,10	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	30	psig



Notes: Mean vel. measured at Side 8

CA 5/9/13

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/9/2013

Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-16**
Date	5/9/2013	Fan configuration	**Fan A&B**
Tester	EA, CA	Fan Setting	**35** **Hz**
Stack Dia.	11.922 in.	Stack Temp	95 deg F
Stack X-Area	111.6 in.2	Start/End Time	1300/1600
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I4
Order ----->	1st		2nd

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1683	1588	1309	1526.7	1884	2342	2012	2079.3
2	1.25	1953	1877	1709	1846.3	2395	2828	2569	2597.3
3	2.31	1894	2118	2081	2031.0	2467	2895	2665	2675.7
4	3.85	1959	1898	1968	1941.7	2450	2690	2690	2610.0
Center	5.96	2158	2106	2073	2112.3	2233	2421	2456	2370.0
5	8.07	2063	1946	2104	2037.7	1867	2209	2197	2091.0
6	9.61	2091	1898	2063	2017.3	1844	1962	1979	1928.3
7	10.67	1812	1655	1770	1745.7	1680	1757	1677	1704.7
8	11.42	1336	1309	1332	1325.7	935	932	1133	1000.0
Averages ---------->		1883.2	1821.7	1823.2	1842.7	1972.8	2226.2	2153.1	2117.4

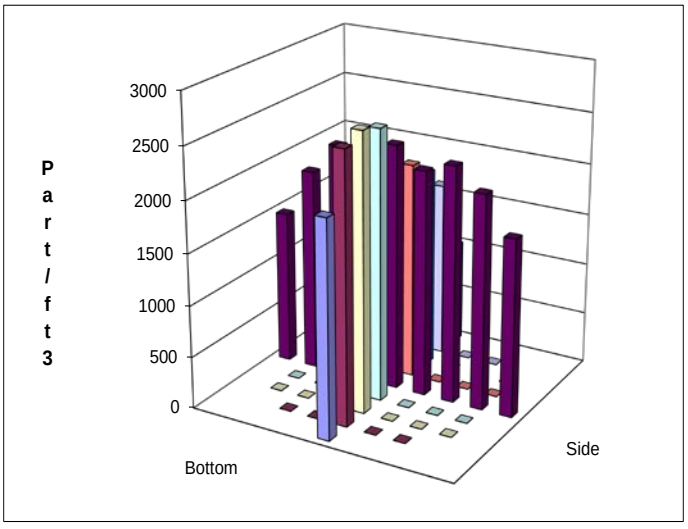
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Top	All	Normlzd
Mean	1980.0		Mean	1961.7	2282.4	2122.1	2241.72
Min Point	1000.0	-49.5%	Std. Dev.	127.0	379.6	318.8	278.68
Max Point	2675.7	35.1%	COV as %	6.5	16.6	**15.0**	**12.43**

Avg Conc 1947 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.2	2.2	psig
Stack Temp	93.3	96.7	F
Mean Velocity	3779	3410	afpm
Ambient pressure	30.06	30.09	inHg
Ambient humidity	21%	20%	RH
Ambient temp	91.4	91.4	F
Back-Gd aerosol	3,2,3,6	10,6,11,3	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	30	psig



Notes: Mean vel. measured at bottom 8

CA 5/9/13

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/9/2013

Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-16**
Date	5/9/2013	Fan configuration	**Fan A&B**
Tester	EA, CA	Fan Setting	**35** **Hz**
Stack Dia.	11.922 in.	Stack Temp	95 deg F
Stack X-Area	111.6 in.2	Start/End Time	1300/1600
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I4
Order ----->	1st		2nd

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1683	1588	1309	1526.7	1884	2342	2012	2079.3
2	1.25	1953	1877	1709	1846.3	2395	2828	2569	2597.3
3	2.31	1894	2118	2081	2031.0	2467	2895	2665	2675.7
4	3.85	1959	1898	1968	1941.7	2450	2690	2690	2610.0
Center	5.96	2158	2106	2073	2112.3	2233	2421	2456	2370.0
5	8.07	2063	1946	2104	2037.7	1867	2209	2197	2091.0
6	9.61	2091	1898	2063	2017.3	1844	1962	1979	1928.3
7	10.67	1812	1655	1770	1745.7	1680	1757	1677	1704.7
8	11.42	1336	1309	1332	1325.7	935	932	1133	1000.0
Averages ---------->		1883.2	1821.7	1823.2	1842.7	1972.8	2226.2	2153.1	2117.4

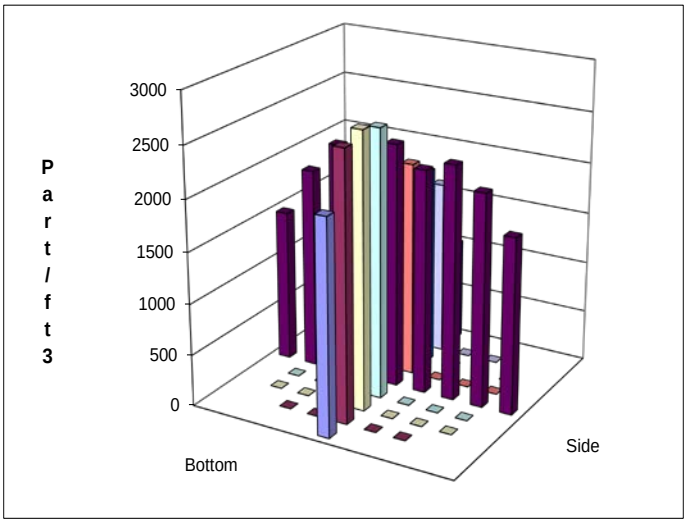
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Top	All	Normlzd
Mean	1980.0		Mean	1961.7	2282.4	2122.1	2241.72
Min Point	1000.0	-49.5%	Std. Dev.	127.0	379.6	318.8	278.68
Max Point	2675.7	35.1%	COV as %	6.5	16.6	**15.0**	**12.43**

Avg Conc 1947 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.2	2.2	psig
Stack Temp	93.3	96.7	F
Mean Velocity	3779	3410	afpm
Ambient pressure	30.06	30.09	inHg
Ambient humidity	21%	20%	RH
Ambient temp	91.4	91.4	F
Back-Gd aerosol	3,2,3,6	10,6,11,3	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	30	psig



Notes: Mean vel. measured at bottom 8

CA 5/9/13

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/9/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-17**
Date	5/10/2013	Fan configuration	**Fan A&B**
Tester	EA, CA	Fan Setting	**39** **Hz**
Stack Dia.	11.922 in.	Stack Temp	84.25 deg F
Stack X-Area	111.6 in.2	Start/End Time	845/1100
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I3
Order ----->	2nd		1st

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	978	887	872	912.3	1296	1372	1229	1299.0
2	1.25	1325	1210	1274	1269.7	1866	1772	1618	1752.0
3	2.31	1190	1055	1170	1138.3	1947	1777	1683	1802.3
4	3.85	1093	1266	1007	1122.0	1692	1649	1556	1632.3
Center	5.96	1016	996	1096	1036.0	1495	1602	1417	1504.7
5	8.07	1080	1038	999	1039.0	1429	1371	1226	1342.0
6	9.61	897	995	1060	984.0	1302	1321	1062	1228.3
7	10.67	861	891	843	865.0	1074	1133	1051	1086.0
8	11.42	596	597	544	579.0	495	573	562	543.3
Averages ---------->		1004.0	992.8	985.0	993.9	1399.6	1396.7	1267.1	1354.4

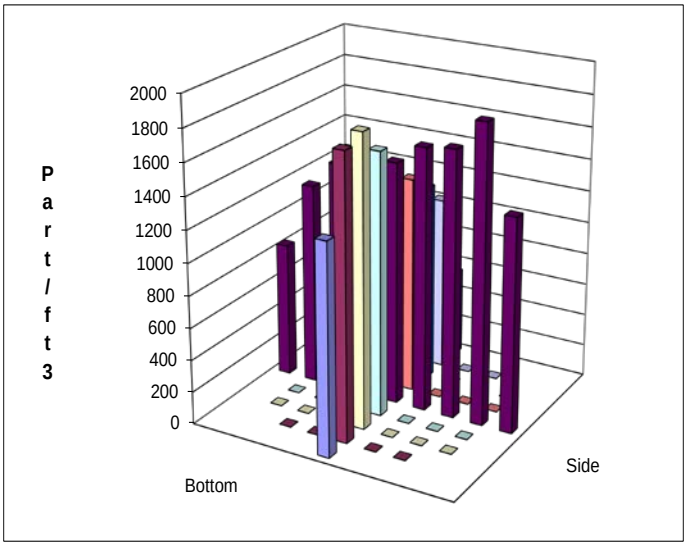
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Top	All	Normlzd
Mean	1174.2		Mean	1064.9	1478.2	1271.5	1512.41
Min Point	543.3	-53.7%	Std. Dev.	128.2	270.6	295.6	225.94
Max Point	1802.3	53.5%	COV as %	12.0	18.3	**23.2**	**14.94**

Avg Conc 1162 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.3	2.3	psig
Stack Temp	81	87.5	F
Mean Velocity	3860	3727	afpm
Ambient pressure	30	30.03	inHg
Ambient humidity	32%	26%	RH
Ambient temp	77.9	81.5	F
Back-Gd aerosol	11,21,10,19	8,7,9,4	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	38	psig



Notes: Mean vel. measured at bottom 8

CA 5/10/13

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/10/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-18**
Date	5/14/2013	Fan configuration	**Fan B**
Tester	EA,CA	Fan Setting	**57.8** **Hz**
Stack Dia.	11.922 in.	Stack Temp	67.45 deg F
Stack X-Area	111.6 in.2	Start/End Time	845/1054
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I3
Order ----->	2nd		1st

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1107	968	1084	1053.0	1091	1271	1362	1241.3
2	1.25	1152	911	1149	1070.7	1363	1403	1491	1419.0
3	2.31	1091	1008	1205	1101.3	1347	1455	1566	1456.0
4	3.85	1318	1309	1406	1344.3	1511	1606	1475	1530.7
Center	5.96	1564	1686	1652	1634.0	1641	1777	1446	1621.3
5	8.07	1618	1733	1534	1628.3	1438	1586	1097	1373.7
6	9.61	1454	1483	1734	1557.0	1375	1388	918	1227.0
7	10.67	1249	1417	1734	1466.7	1154	1135	1141	1143.3
8	11.42	958	583	945	828.7	576	400	564	513.3
Averages ---------->		1279.0	1233.1	1382.6	1298.2	1277.3	1335.7	1228.9	1280.6

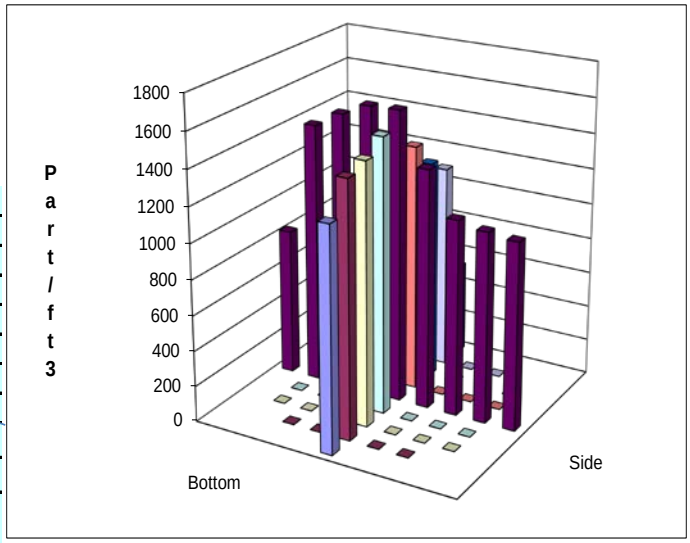
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Top	All	Normlzd
Mean	1289.4		Mean	1400.3	1395.9	1398.1	1403.55
Min Point	513.3	-60.2%	Std. Dev.	236.9	166.3	196.7	197.18
Max Point	1634.0	26.7%	COV as %	16.9	11.9	**14.1**	**14.05**

Avg Conc 1247 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.6	2.6	psig
Stack Temp	64.5	70.4	F
Mean Velocity	3852	3788	afpm
Ambient pressure	30.15	30.15	inHg
Ambient humidity	34%	29%	RH
Ambient temp	63.5	67.1	F
Back-Gd aerosol	3,5,3,9	1,5,6,10	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	30	psig



Notes: Mean velocity measured at Side Center

CA 5/14/2013

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of Port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/14/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-19**
Date	5/14/2013	Fan configuration	**Fan B**
Tester	EA, CA	Fan Setting	**57.8** **Hz**
Stack Dia.	11.922 in.	Stack Temp	72.15 deg F
Stack X-Area	111.6 in.2	Start/End Time	1100/1227
Test Port	Ref. Port(reading port)	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	179.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I3
Order ----->	2nd		1st

		Side				Bottom			
Traverse-->									
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1224	1027	1027	1092.7	896	886	819	867.0
2	1.25	1469	1503	1384	1452.0	1394	1292	1391	1359.0
3	2.31	1575	1542	1684	1600.3	1641	1469	1599	1569.7
4	3.85	1491	1613	1746	1616.7	1634	1537	1586	1585.7
Center	5.96	1334	1506	1536	1458.7	1738	1534	1713	1661.7
5	8.07	950	1108	1243	1100.3	1674	1538	1605	1605.7
6	9.61	921	1011	1090	1007.3	1560	1404	1561	1508.3
7	10.67	622	757	882	753.7	1405	1003	1471	1293.0
8	11.42	270	534	550	451.3	931	818	1066	938.3
Averages ---------->		1095.1	1177.9	1238.0	1170.3	1430.3	1275.7	1423.4	1376.5

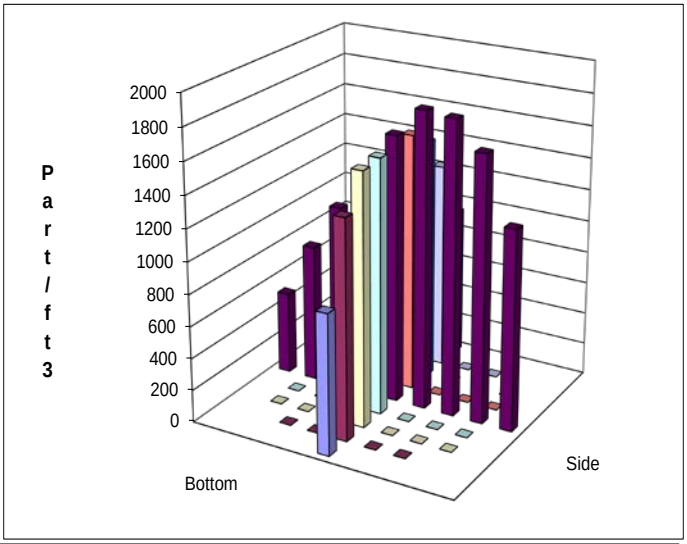
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Top	All	Normlzd
Mean	1273.4		Mean	1284.1	1511.9	1398.0	1487.36
Min Point	451.3	-64.6%	Std. Dev.	331.9	136.2	270.9	274.21
Max Point	1661.7	30.5%	COV as %	25.8	9.0	**19.4**	**18.44**

Avg Conc 1238 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.6	2.6	psig
Stack Temp	70.4	73.9	F
Mean Velocity	3788	3931	afpm
Ambient pressure	30.15	30.18	inHg
Ambient humidity	25%	24%	RH
Ambient temp	74.3	74.3	F
Back-Gd aerosol	2,5,4,5	7,2,2,4	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	30	psig



Notes: Mean velocity measured at Side Center
Ref port(port 1 is the ref port for this test) upstream of reading Port (which is ref port for this test)

CA 5/14/2013

Oil Used: Edwards

Ref. Probe Location: Ref port upstream of reading Port

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 5/14/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 7/17/2013
Signature on file with original TI-WTPSP-110

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-20**
Date	5/14/2013	Fan configuration	**Fan B**
Tester	EA,CA	Fan Setting	**54.1** **Hz**
Stack Dia.	11.922 in.	Stack Temp	78.35 deg F
Stack X-Area	111.6 in.2	Start/End Time	1300/1430
Test Port	Ref Port(reading port)	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	179.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	1st		2nd

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1217	1316	1177	1236.7	1007	808	937	917.3
2	1.25	1821	1637	1688	1715.3	1160	1275	1250	1228.3
3	2.31	1832	1778	1818	1809.3	1299	1351	1313	1321.0
4	3.85	1752	1860	1689	1767.0	1393	1456	1479	1442.7
Center	5.96	1620	1612	1581	1604.3	1697	1852	1880	1809.7
5	8.07	1396	1525	1497	1472.7	2063	2059	2243	2121.7
6	9.61	1309	1340	1536	1395.0	1991	1991	2001	1994.3
7	10.67	979	804	1309	1030.7	1876	1719	1750	1781.7
8	11.42	857	874	1093	941.3	1027	1075	1176	1092.7
Averages ---------->		1420.3	1416.2	1487.6	1441.4	1501.4	1509.6	1558.8	1523.3

All	pt/ft3	Dev. from mean
Mean	1482.3	
Min Point	917.3	-38.1%
Max Point	2121.7	43.1%

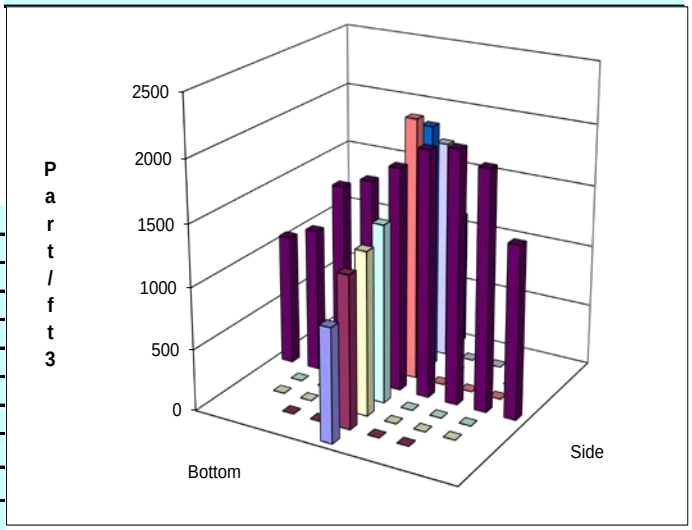
Center 2/3	Side	Top	All	Normlzd
Mean	1542.0	1671.3	1606.7	1705.37
Std. Dev.	272.0	343.9	305.4	315.10
COV as %	17.6	20.6	**19.0**	**18.48**

Avg Conc 1454 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.5	2.5	psig
Stack Temp	78.5	78.2	F
Mean Velocity	3830	3863	afpm
Ambient pressure	30.18	30.18	inHg
Ambient humidity	20%	23%	RH
Ambient temp	84.2	72.5	F
Back-Gd aerosol	2,0,1,0	8,1,3,5	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	30	psig



Notes: Mean velocity measured at Side Center
Ref port(port 1 is the ref port for this test) upstream of reading Port (which is ref port for this test)

CA 5/14/2013

Oil Used: Edwards

Ref. Probe Location: Ref port upstream of reading port

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/14/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-21**
Date	5/15/2013	Fan configuration	**Fan B**
Tester	EA,CA	Fan Setting	**54.1** **Hz**
Stack Dia.	11.922 in.	Stack Temp	62.75 deg F
Stack X-Area	111.6 in.2	Start/End Time	830/1100
Test Port	Ref Port	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	179.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	2nd		1st

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1418	1446	1429	1431.0	922	1018	1096	1012.0
2	1.25	1595	1675	1639	1636.3	1170	1250	1211	1210.3
3	2.31	1766	1653	1735	1718.0	1130	1184	1208	1174.0
4	3.85	1665	1698	1753	1705.3	1164	1261	1297	1240.7
Center	5.96	1598	1673	1658	1643.0	1539	1585	1605	1576.3
5	8.07	1496	1655	1686	1612.3	1811	1902	1960	1891.0
6	9.61	1523	1690	1719	1644.0	1840	1758	1908	1835.3
7	10.67	1252	1309	1521	1360.7	1629	1646	1579	1618.0
8	11.42	777	788	959	841.3	749	746	978	824.3
Averages ---------->		1454.4	1509.7	1566.6	1510.2	1328.2	1372.2	1426.9	1375.8

All	pt/ft3	Dev. from mean
Mean	1443.0	
Min Point	824.3	-42.9%
Max Point	1891.0	31.0%

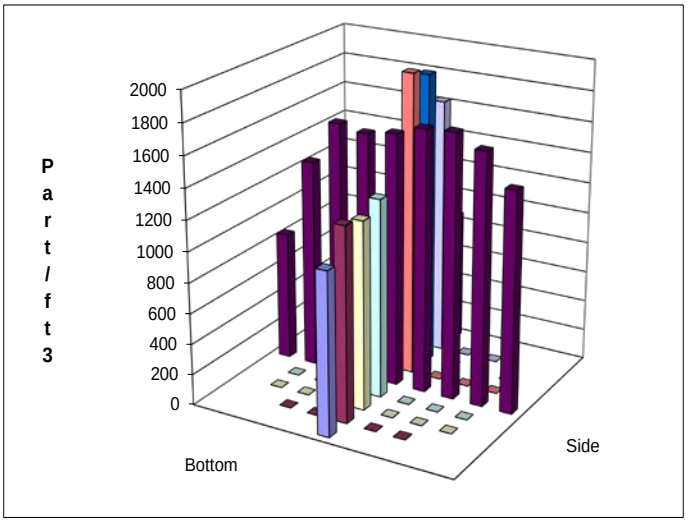
Center 2/3	Side	Top	All	Normlzd
Mean	1617.1	1506.5	1561.8	1593.67
Std. Dev.	119.4	300.6	227.1	229.09
COV as %	7.4	20.0	**14.5**	**14.37**

Avg Conc 1422 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	3.0	3	psig
Stack Temp	59.1	66.4	F
Mean Velocity	3844	3844	afpm
Ambient pressure	30.06	30.06	inHg
Ambient humidity	31%	25%	RH
Ambient temp	67	73.4	F
Back-Gd aerosol	14,7,10,7	2,2,2,3	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	32	32	psig



Notes: Mean velocity measured at Side center.
Ref port is the port for reading data and port 1 is the ref. data.

CA 5/15/13

Oil Used: Edwards

Ref. Probe Location: Ref port upstream of reding port

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 5/15/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 7/17/2013
Signature on file with original TI-WTPSP-110

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-22**
Date	5/15/2013	Fan configuration	**Fan A&B**
Tester	EA,CA	Fan Setting	**22.1** **Hz**
Stack Dia.	11.922 in.	Stack Temp	71.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	1110/1330
Test Port	Ref port	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	179.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	1st		2nd

		Side				Bottom			
Traverse-->									
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1389	1477	1301	1389.0	1359	1698	1743	1600.0
2	1.25	1610	1563	1618	1597.0	1802	1921	1879	1867.3
3	2.31	1632	1625	1718	1658.3	1815	1992	2008	1938.3
4	3.85	1590	1548	1617	1585.0	1861	2034	2050	1981.7
Center	5.96	1633	1596	1615	1614.7	1784	1869	1946	1866.3
5	8.07	1705	1585	1575	1621.7	1750	1841	1855	1815.3
6	9.61	1434	1545	1511	1496.7	1640	1740	1834	1738.0
7	10.67	1320	1407	1357	1361.3	1553	1614	1860	1675.7
8	11.42	1110	1054	1045	1069.7	1470	1472	1423	1455.0
Averages ---------->		1491.4	1488.9	1484.1	1488.1	1670.4	1797.9	1844.2	1770.9

All	pt/ft3	Dev. from mean
Mean	1629.5	
Min Point	1069.7	-34.4%
Max Point	1981.7	21.6%

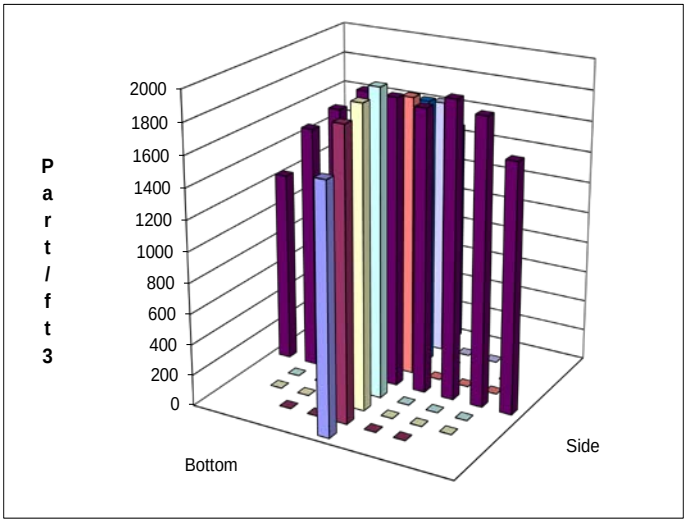
Center 2/3	Side	Top	All	Normlzd
Mean	1562.1	1840.4	1701.2	1822.97
Std. Dev.	101.6	107.4	175.9	109.59
COV as %	6.5	5.8	**10.3**	**6.01**

Avg Conc 1616 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	1.4	1.4	psig
Stack Temp	67.8	75.2	F
Mean Velocity	1788	1827	afpm
Ambient pressure	30.06	30.03	inHg
Ambient humidity	25%	22%	RH
Ambient temp	70.7	81.9	F
Back-Gd aerosol	1,1,4,5	5,8,5,4	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	30	psig



Notes: Mean velocity measured at Bottom 8

Ref port is the port for reading data and port 1 is the ref. data. The compresor stoped so we repeted the test for col.1 and 2.

CA 5/15/13

Oil Used: Edwards

Ref. Probe Location: Ref port upstream of reding port

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/15/2013
Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	LV-C2 Model	Run No.	PT-23
Date	5/15/2013	Fan configuration	Fan A&B
Tester	EA,CA	Fan Setting	21 Hz
Stack Dia.	11.922 in.	Stack Temp	78.05 deg F
Stack X-Area	111.6 in.2	Start/End Time	230/430
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
Order ----->	2nd		1st

		Side				Bottom			
Traverse-->									
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	1719	1552	1382	1551.0	2094	2161	1893	2049.3
2	1.25	1739	1511	1449	1566.3	2238	2279	2126	2214.3
3	2.31	1537	1401	1321	1419.7	2151	2144	2024	2106.3
4	3.85	1261	1293	1317	1290.3	2009	1968	1905	1960.7
Center	5.96	1184	1231	1233	1216.0	1773	1839	1765	1792.3
5	8.07	1013	1414	1104	1177.0	1665	1749	1591	1668.3
6	9.61	1393	1378	1161	1310.7	1529	1487	1478	1498.0
7	10.67	1215	1390	1252	1285.7	1469	1267	1269	1335.0
8	11.42	1313	1180	1174	1222.3	1171	1038	1026	1078.3
Averages ---------->		1374.9	1372.2	1265.9	1337.7	1788.8	1770.2	1675.2	1744.7

All	pt/ft3	Dev. from mean
Mean	1541.2	
Min Point	1078.3	-30.0%
Max Point	2214.3	43.7%

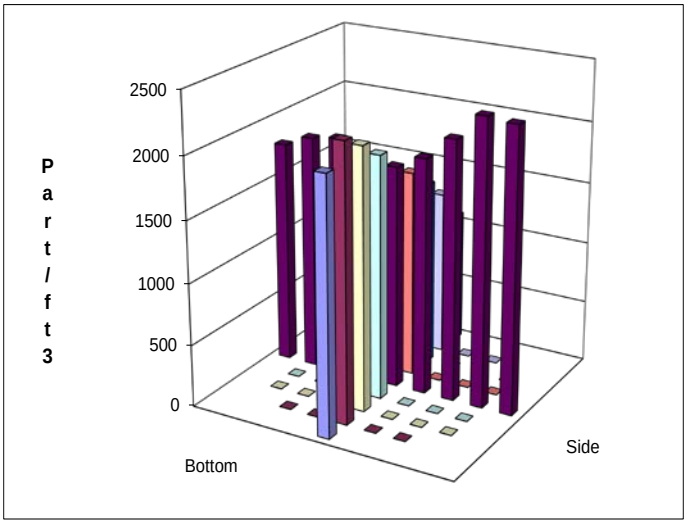
Center 2/3	Side	Top	All	Normlzd
Mean	1323.7	1796.4	1560.0	1873.73
Std. Dev.	131.6	320.4	339.9	266.82
COV as %	9.9	17.8	**21.8**	**14.24**

Avg Conc 1546 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	1.2	1.2	psig
Stack Temp	81.3	74.8	F
Mean Velocity	1832	1738	afpm
Ambient pressure	30.03	30	inHg
Ambient humidity	23%	22%	RH
Ambient temp	78.8	77.9	F
Back-Gd aerosol	8,3,7,4	4,7,3,4	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	30	psig



Notes: Mean velocity measured at bottom8.

CA /15/13

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of port 1

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu
Signature/date	5/15/2013

Technical Data Review performed by:	Elizabeth Golovich
Signature/date	7/17/2013
Signature on file with original TI-WTPSP-110	

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**PT-24**
Date	5/16/2013	Fan configuration	**Fan B**
Tester	EA,CA	Fan Setting	**57** **Hz**
Stack Dia.	11.922 in.	Stack Temp	83.05 deg F
Stack X-Area	111.6 in.2	Start/End Time	1:00/3:20
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I3
Order ----->	2nd		1st

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	891	764	694	783.0	1386	1498	1438	1440.7
2	1.25	901	659	809	789.7	1569	1802	1632	1667.7
3	2.31	1054	930	956	980.0	1552	1666	1657	1625.0
4	3.85	1323	1405	1397	1375.0	1786	1842	1746	1791.3
Center	5.96	1743	1808	1804	1785.0	1828	1663	1837	1776.0
5	8.07	1701	1718	1983	1800.7	1514	1342	1563	1473.0
6	9.61	1697	1769	1953	1806.3	1325	947	1309	1193.7
7	10.67	1784	1662	1835	1760.3	934	654	992	860.0
8	11.42	1474	954	1441	1289.7	364	490	495	449.7
Averages ---------->		1396.4	1296.6	1430.2	1374.4	1362.0	1322.7	1407.7	1364.1

All	pt/ft3	Dev. from mean
Mean	1369.3	
Min Point	449.7	-67.2%
Max Point	1806.3	31.9%

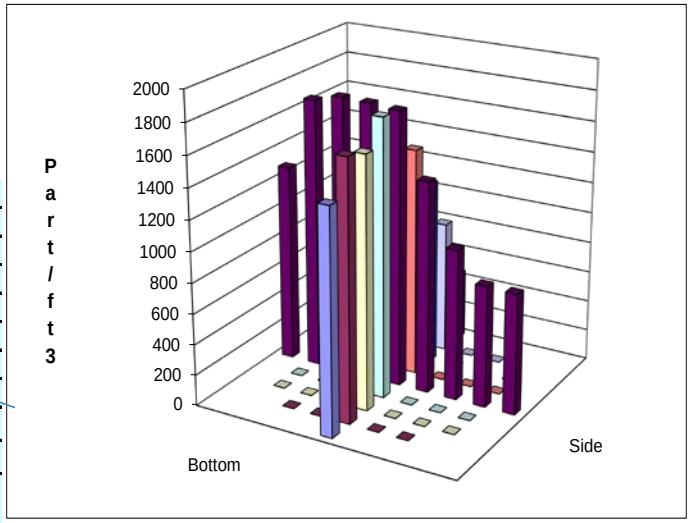
Center 2/3	Side	Top	All	Normlzd
Mean	1471.0	1483.8	1477.4	1481.16
Std. Dev.	431.7	343.3	374.7	375.57
COV as %	29.3	23.1	**25.4**	**25.36**

Avg Conc 1318 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		12/10/2013
Fisher Scientific Barometer		90936818	12/11/2013
Met One OPC	1011529010	ref	1/14/2014
Met One OPC	1011529009	sample	1/14/2014

	Start	Finish	
Generator Inlet Press	2.4	2.4	psig
Stack Temp	82.7	83.4	F
Mean Velocity	3824	3912	afpm
Ambient pressure	29.94	29.94	inHg
Ambient humidity	23%	23%	RH
Ambient temp	79.7	79.7	F
Back-Gd aerosol	6,10,2,5	6,7,3,2	pt/ft3
No. Bk-Gd samples	4	4	
Compressor output	30	36	psig



Notes: Mean velocity measured at Side Center

CA 5/16/2013

Oil Used: Edwards

Ref. Probe Location: Ref port downstream of Port 1

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 5/16/2013

Technical Data Review performed by: Elizabeth Golovich
Signature/date 7/17/2013
Signature on file with original TI-WTPSP-110

Appendix C

LV-C2 Retest Data Sheets

C.1 LV-C2 Velocity Uniformity Data Sheets

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Remedial Scale Model**	Run No.	**VT-1**
Date	**1/9/15**	Fan Configuration	**Fan B Max**
Testers	CA, EA	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	39.1 deg F
Stack X-Area	111.6 in.2	Start/End Time	900/1014
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

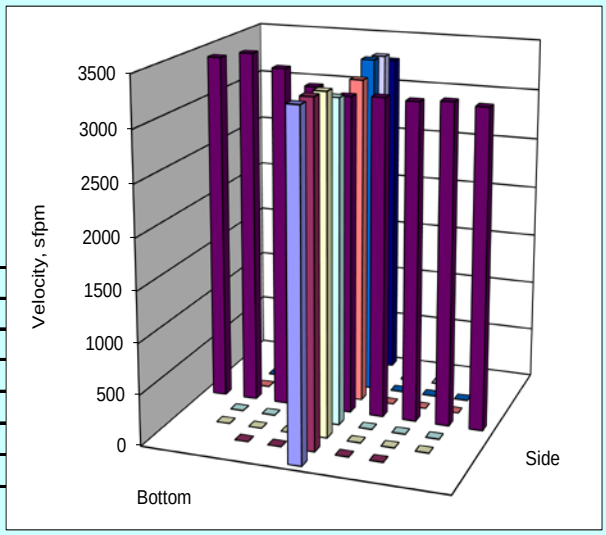
Order -->		1				2			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	3124	3151	3099	3124.7	3312	3208	3230	3250.0
2	1.25	3246	3131	3075	3150.7	3316	3236	3211	3254.3
3	2.31	3207	3108	3072	3129.0	3319	3170	3233	3240.7
4	3.85	3193	3151	3084	3142.7	3162	3069	3133	3121.3
Center	5.96	3158	3151	3080	3129.7	3104	3053	3045	3067.3
5	8.07	3210	3214	3174	3199.3	3154	3189	3140	3161.0
6	9.61	3363	3368	3322	3351.0	3203	3347	3336	3295.3
7	10.67	3513	3485	3435	3477.7	3122	3345	3357	3274.7
8	11.42	3444	3409	3398	3417.0	3098	3253	3181	3177.3
Averages ---------->		3273.1	3240.9	3193.2	3235.7	3198.9	3207.8	3207.3	3204.7

All	s ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	3220.2		Mean	3225.7	3202.1	3213.9
Min Point	3067.3	-4.7%	Std. Dev.	136.0	86.2	110.1
Max Point	3477.7	8.0%	COV as %	4.2	2.7	**3.4**

Flow w/o C-Pt	2508	acfm
Vel Avg w/o C-Pt	3235	afpm

	Start	Finish	
Stack temp	38.8	39.4	F
Equipment temp	NA	NA	F
Ambient temp	14.5	15.9	F
Stack static	NA	NA	mbars
Ambient pressure	29.87	29.87	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	46.8%	42.1%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes: We took out the middle section of the downstream duct.

CA 1/9/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/9/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Remedial ScaleModel**	Run No.	**VT-2**
Date	**1/9/15**	Fan Configuration	**Fan B max**
Testers	CA,EA	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	39.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	1018/1046
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	ft/min	Data Files:	NA

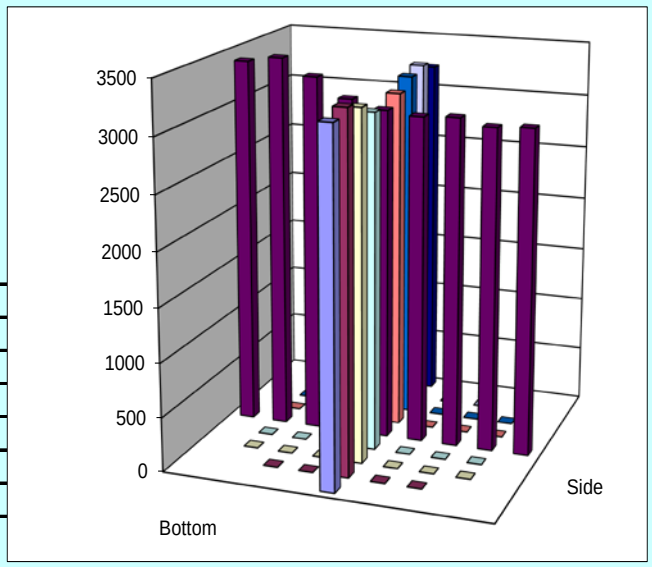
Order -->		2				1			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	3005	2964	3000	2989.7	3190	3304	3165	3219.7
2	1.25	2901	3005	3006	2970.7	3249	3294	3294	3279.0
3	2.31	3008	2995	3092	3031.7	3209	3188	3244	3213.7
4	3.85	3000	2989	3057	3015.3	3095	3124	3096	3105.0
Center	5.96	3040	3058	3055	3051.0	3077	3026	3066	3056.3
5	8.07	3112	3125	3146	3127.7	3157	3124	3152	3144.3
6	9.61	3309	3302	3310	3307.0	3300	3263	3152	3238.3
7	10.67	3421	3430	3522	3457.7	3388	3236	3233	3285.7
8	11.42	3352	3392	3477	3407.0	3067	3409	3162	3212.7
Averages ---------->		3127.6	3140.0	3185.0	3150.9	3192.4	3218.7	3173.8	3195.0

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	3172.9		Mean	3137.3	3188.9	3163.1
Min Point	2970.7	-6.4%	Std. Dev.	179.2	88.6	138.5
Max Point	3457.7	9.0%	COV as %	5.7	2.8	**4.4**

Flow w/o C-Pt	2471	acfm
Vel Avg w/o C-Pt	3188	afpm

	Start	Finish	
Stack temp	39.4	39.6	F
Equipment temp	NA	NA	F
Ambient temp	15.9	15.1	C
Stack static	NA	NA	mbars
Ambient pressure	29.87	29.86	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	42.1%	43.8%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes:

CA 1/9/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/9/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Remedial Scale Model**	Run No.	**VT-3**
Date	**1/9/15**	Fan Configuration	**Fan B max**
Testers	CA,EA	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	39.6 deg F
Stack X-Area	111.6 in.2	Start/End Time	1056/1120
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	ft/min	Data Files:	NA

Order -->		1				2			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	2978	2884	2870	2910.7	3126	3206	3092	3141.3
2	1.25	2967	2953	2950	2956.7	3198	3260	3212	3223.3
3	2.31	3002	3000	2981	2994.3	3174	3208	3142	3174.7
4	3.85	3061	3034	3043	3046.0	3133	3066	3070	3089.7
Center	5.96	3071	3091	3060	3074.0	3060	3070	3088	3072.7
5	8.07	3156	3119	3144	3139.7	3206	3264	3306	3258.7
6	9.61	3268	3285	3298	3283.7	3274	3307	3342	3307.7
7	10.67	3408	3414	3403	3408.3	3195	3327	3316	3279.3
8	11.42	3404	3393	3405	3400.7	3080	3269	3156	3168.3
Averages ---------->		3146.1	3130.3	3128.2	3134.9	3160.7	3219.7	3191.6	3190.6

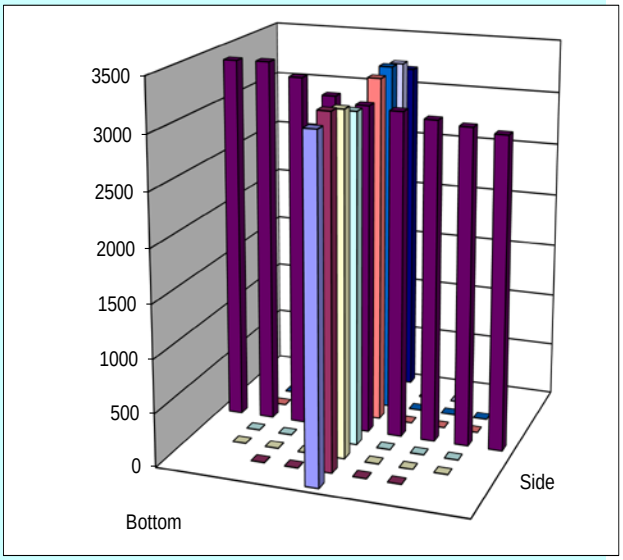
All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	3162.8		Mean	3129.0	3200.9	3164.9
Min Point	2910.7	-8.0%	Std. Dev.	163.2	92.1	132.7
Max Point	3408.3	7.8%	COV as %	5.2	2.9	**4.2**

Flow w/o C-Pt 2461 acfm

Vel Avg w/o C-Pt 3174 afpm

	Start	Finish	
Stack temp	39.6	39.5	F
Equipment temp	NA	NA	F
Ambient temp	15.6	14.2	C
Stack static	NA	NA	mbars
Ambient pressure	29.86	29.84	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	40.7%	47.8%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes: We nedeed to change the batteries for the TSI.

CA 1/9/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/9/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Model**	Run No.	**VT-4**
Date	**1/9/15**	Fan Configuration	**Fan B min**
Testers	CA,EA	Fan Setting	**28** **Hz**
Stack Dia.	11.922 in.	Stack Temp	39.0 deg F
Stack X-Area	111.6 in.2	Start/End Time	1128/1150
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	ft/min	Data Files:	NA

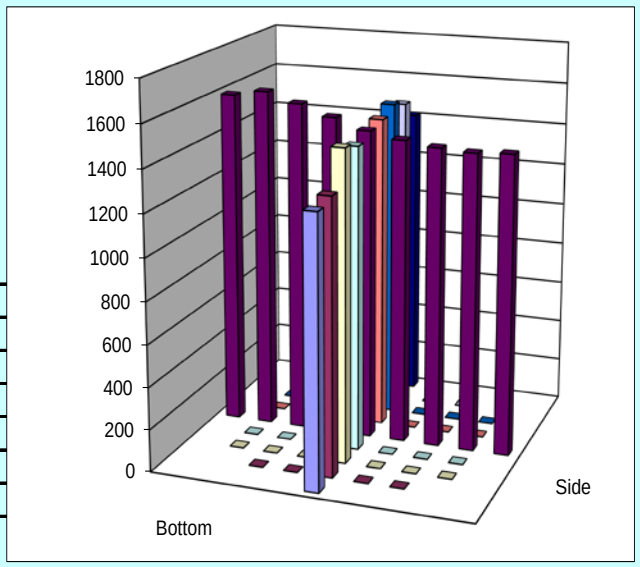
Order -->		2				1			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	1470	1308	1330	1369.3	1383	1148	1287	1272.7
2	1.25	1396	1319	1366	1360.3	1337	1264	1293	1298.0
3	2.31	1377	1362	1371	1370.0	1496	1497	1424	1472.3
4	3.85	1407	1377	1391	1391.7	1510	1482	1334	1442.0
Center	5.96	1444	1401	1415	1420.0	1487	1445	1494	1475.3
5	8.07	1462	1469	1474	1468.3	1485	1473	1524	1494.0
6	9.61	1521	1518	1515	1518.0	1507	1508	1580	1531.7
7	10.67	1556	1560	1570	1562.0	1503	1430	1568	1500.3
8	11.42	1545	1534	1529	1536.0	1413	1392	1427	1410.7
Averages ---------->		1464.2	1427.6	1440.1	1444.0	1457.9	1404.3	1436.8	1433.0

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	1438.5		Mean	1441.5	1459.1	1450.3
Min Point	1272.7	-11.5%	Std. Dev.	77.2	76.2	74.3
Max Point	1562.0	8.6%	COV as %	5.4	5.2	**5.1**

Flow w/o C-Pt	1114	acfm
Vel Avg w/o C-Pt	1437	afpm

	Start	Finish	
Stack temp	39.6	38.4	F
Equipment temp	NA	NA	F
Ambient temp	15	16.3	C
Stack static	NA	NA	mbars
Ambient pressure	29.84	29.83	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	43.1%	38.5%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes:

CA 1/9/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/9/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Remedial Scale Model**	Run No.	**VT-5**
Date	**1/12/15**	Fan Configuration	**Fan B Normal**
Testers	CA, EA	Fan Setting	**45** **Hz**
Stack Dia.	11.922 in.	Stack Temp	40.6 deg F
Stack X-Area	111.6 in.2	Start/End Time	900/930
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

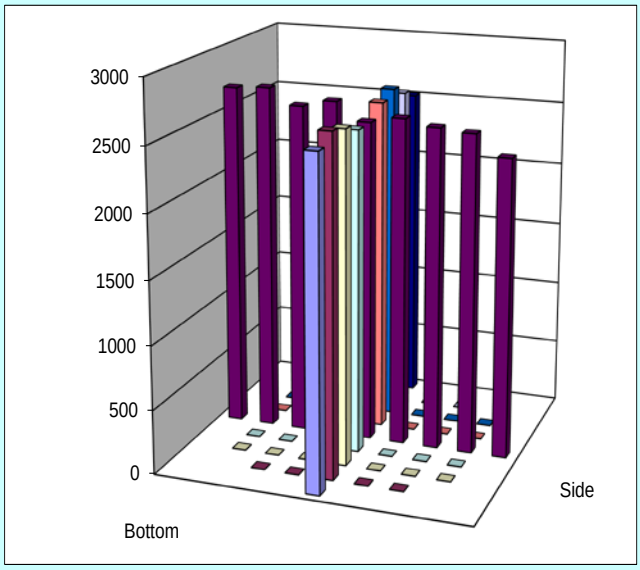
Order -->		1				2			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	2277	2349	2381	2335.7	2540	2538	2434	2504.0
2	1.25	2528	2464	2500	2497.3	2575	2560	2617	2584.0
3	2.31	2488	2509	2566	2521.0	2543	2567	2520	2543.3
4	3.85	2560	2588	2556	2568.0	2467	2524	2437	2476.0
Center	5.96	2536	2516	2505	2519.0	2471	2485	2464	2473.3
5	8.07	2496	2956	2523	2658.3	2557	2520	2619	2565.3
6	9.61	2650	2518	2639	2602.3	2594	2591	2665	2616.7
7	10.67	2705	2730	2740	2725.0	2551	2480	2572	2534.3
8	11.42	2686	2732	2702	2706.7	2444	2414	2526	2461.3
Averages ---------->		2547.3	2595.8	2568.0	2570.4	2526.9	2519.9	2539.3	2528.7

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	2549.5		Mean	2584.4	2541.9	2563.1
Min Point	2335.7	-8.4%	Std. Dev.	83.4	53.3	70.7
Max Point	2725.0	6.9%	COV as %	3.2	2.1	**2.8**

Flow w/o C-Pt	1982	acfm
Vel Avg w/o C-Pt	2556	afpm

	Start	Finish	
Stack temp	40.5	40.7	F
Equipment temp	NA	NA	F
Ambient temp	18.1	16.2	C
Stack static	NA	NA	mbars
Ambient pressure	29.95	29.97	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	35.7%	43.8%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes:

CA 1/12/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/12/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Remedial Scale Model**	Run No.	**VT-6**
Date	**1/12/15**	Fan Configuration	**Fan B Normal**
Testers	CA,EA	Fan Setting	**49** **Hz**
Stack Dia.	11.922 in.	Stack Temp	41.1 deg F
Stack X-Area	111.6 in.2	Start/End Time	935/956
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

Order -->		2				1			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	2481	2503	2573	2519.0	2764	2739	2750	2751.0
2	1.25	2591	2651	2617	2619.7	2873	2839	2822	2844.7
3	2.31	2616	2619	2628	2621.0	2887	2744	2769	2800.0
4	3.85	2612	2609	2620	2613.7	2791	2661	2682	2711.3
Center	5.96	2615	2665	2638	2639.3	2640	2669	2733	2680.7
5	8.07	2742	2749	2759	2750.0	2761	2785	2807	2784.3
6	9.61	2912	2923	2942	2925.7	2919	2876	2894	2896.3
7	10.67	3106	3054	3064	3074.7	2894	2793	2845	2844.0
8	11.42	3029	2956	2993	2992.7	2782	2771	2791	2781.3
Averages ---------->		2744.9	2747.7	2759.3	2750.6	2812.3	2764.1	2788.1	2788.2

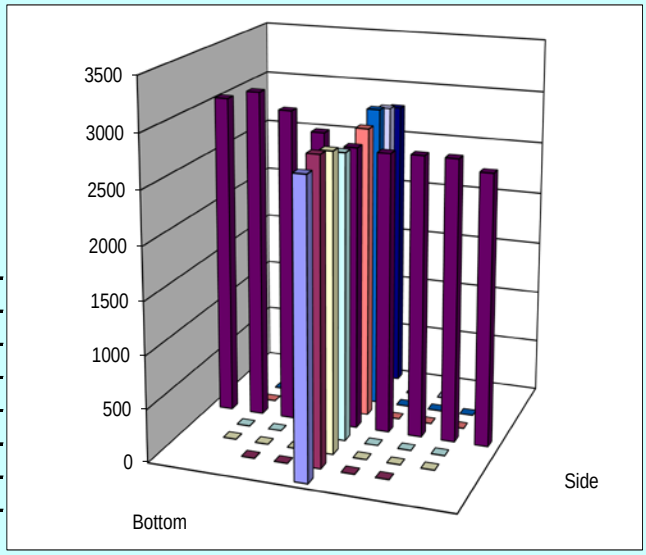
All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	2769.4		Mean	2749.1	2794.5	2771.8
Min Point	2519.0	-9.0%	Std. Dev.	182.9	76.8	136.8
Max Point	3074.7	11.0%	COV as %	6.7	2.7	**4.9**

Flow w/o C-Pt 2158 acfm

Vel Avg w/o C-Pt 2783 afpm

	Start	Finish	
Stack temp	40.7	41.5	F
Equipment temp	NA	NA	F
Ambient temp	16.8	15.4	C
Stack static	NA	NA	mbars
Ambient pressure	29.97	29.98	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	37.6%	42.2%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes:

CA 1/12/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/12/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	LV-C2 Remedial Scale Model	Run No.	VT-7
Date	1/12/15	Fan Configuration	Fan B Normal
Testers	CA, EA	Fan Setting	42 Hz
Stack Dia.	11.922 in.	Stack Temp	41.6 deg F
Stack X-Area	111.6 in.2	Start/End Time	1000/1021
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

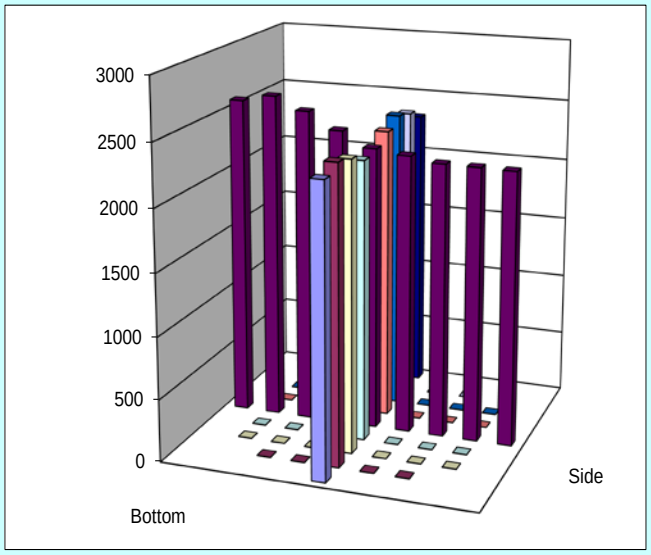
Order -->		1				2			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	2156	2144	2175	2158.3	2334	2325	2293	2317.3
2	1.25	2215	2151	2125	2163.7	2415	2374	2346	2378.3
3	2.31	2124	2161	2214	2166.3	2324	2361	2323	2336.0
4	3.85	2218	2211	2188	2205.7	2243	2286	2251	2260.0
Center	5.96	2246	2254	2218	2239.3	2242	2330	2291	2287.7
5	8.07	2342	2382	2347	2357.0	2321	2387	2381	2363.0
6	9.61	2491	2516	2457	2488.0	2402	2490	2405	2432.3
7	10.67	2609	2578	2574	2587.0	2402	2394	2378	2391.3
8	11.42	2512	2592	2497	2533.7	2320	2263	2337	2306.7
Averages ---------->		2323.7	2332.1	2310.6	2322.1	2333.7	2356.7	2333.9	2341.4

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	2331.8		Mean	2315.3	2349.8	2332.5
Min Point	2158.3	-7.4%	Std. Dev.	167.5	60.1	122.2
Max Point	2587.0	10.9%	COV as %	7.2	2.6	**5.2**

Flow w/o C-Pt	1814	acfm
Vel Avg w/o C-Pt	2340	afpm

	Start	Finish	
Stack temp	41.3	41.9	F
Equipment temp	NA	NA	F
Ambient temp	16.8	15.5	C
Stack static	NA	NA	mbars
Ambient pressure	29.98	29.98	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	38.5%	41.8%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes:

CA 1/12/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/12/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Remedial Scale Model**	Run No.	**VT-8**
Date	**1/12/15**	Fan Configuration	**Fan AB Max**
Testers	CA, EA	Fan Setting	**32** **Hz**
Stack Dia.	11.922 in.	Stack Temp	41.9 deg F
Stack X-Area	111.6 in.2	Start/End Time	1025/1100
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

Order -->		2				1			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	2845	2793	2823	2820.3	2787	2800	2789	2792.0
2	1.25	3101	2996	2948	3015.0	3012	3035	3016	3021.0
3	2.31	3167	3082	3077	3108.7	3147	3145	3129	3140.3
4	3.85	3140	3057	3079	3092.0	3054	3064	3089	3069.0
Center	5.96	3048	2975	2984	3002.3	2992	3023	2958	2991.0
5	8.07	2940	2948	2922	2936.7	2974	2922	2926	2940.7
6	9.61	2918	2945	2911	2924.7	2861	2902	2857	2873.3
7	10.67	2874	2869	2848	2863.7	2701	2750	2735	2728.7
8	11.42	2775	2699	2696	2723.3	2594	2612	2654	2620.0
Averages ---------->		2978.7	2929.3	2920.9	2943.0	2902.4	2917.0	2905.9	2908.4

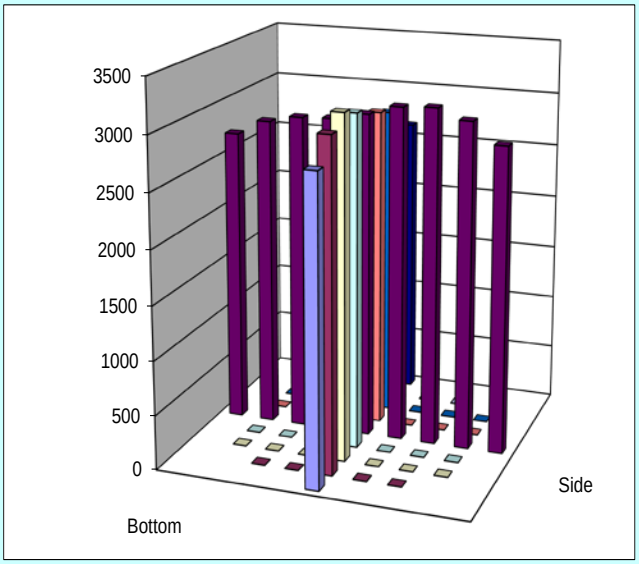
All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	2925.7		Mean	2991.9	2966.3	2979.1
Min Point	2620.0	-10.4%	Std. Dev.	89.7	135.5	111.2
Max Point	3140.3	7.3%	COV as %	3.0	4.6	**3.7**

Flow w/o C-Pt 2261 acfm

Vel Avg w/o C-Pt 2917 afpm

	Start	Finish	
Stack temp	41.5	42.2	F
Equipment temp	NA	NA	F
Ambient temp	18.8	16.4	C
Stack static	NA	NA	mbars
Ambient pressure	29.97	29.97	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	32.8%	39.8%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes:

CA 1/12/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/12/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Remedial Scale Model**	Run No.	**VT-9**
Date	**1/12/15**	Fan Configuration	**Fan AB Max**
Testers	CA, EA	Fan Setting	**32** **Hz**
Stack Dia.	11.922 in.	Stack Temp	42.4 deg F
Stack X-Area	111.6 in.2	Start/End Time	1100/1120
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

Order -->		1				2			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	2805	2840	2827	2824.0	2790	3018	2725	2844.3
2	1.25	2963	2961	2944	2956.0	2994	3095	3027	3038.7
3	2.31	3110	3061	3120	3097.0	3114	3070	3070	3084.7
4	3.85	3077	3056	3025	3052.7	3057	3032	3099	3062.7
Center	5.96	3011	2973	2982	2988.7	3008	2973	3007	2996.0
5	8.07	2945	2946	2965	2952.0	2942	2934	2906	2927.3
6	9.61	2932	2998	2952	2960.7	2875	2863	2879	2872.3
7	10.67	2860	2857	2896	2871.0	2810	2703	2772	2761.7
8	11.42	2695	2698	2993	2795.3	2612	2614	2613	2613.0
Averages --------->		2933.1	2932.2	2967.1	2944.1	2911.3	2922.4	2899.8	2911.2

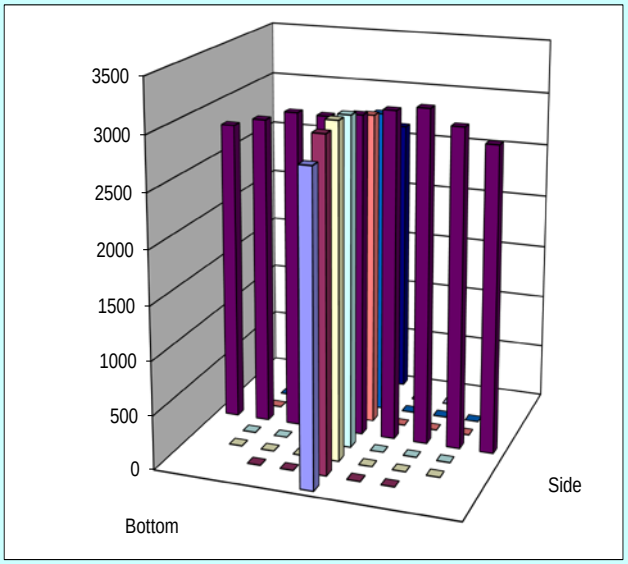
All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	2927.7		Mean	2982.6	2963.3	2973.0
Min Point	2613.0	-10.7%	Std. Dev.	73.7	116.6	94.3
Max Point	3097.0	5.8%	COV as %	2.5	3.9	**3.2**

Flow w/o C-Pt 2263 acfm

Vel Avg w/o C-Pt 2920 afpm

	Start	Finish	
Stack temp	42.2	42.6	F
Equipment temp	NA	NA	F
Ambient temp	18.7	19.9	C
Stack static	NA	NA	mbars
Ambient pressure	29.97	29.97	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	34.1%	31.4%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes:

CA 1/12/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/12/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Remedial Scale Model**	Run No.	**VT-10**
Date	**1/12/15**	Fan Configuration	**Fan AB Max**
Testers	CA, EA	Fan Setting	**32** **Hz**
Stack Dia.	11.922 in.	Stack Temp	42.9 deg F
Stack X-Area	111.6 in.2	Start/End Time	1125/1145
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

Order -->		2				1			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	2775	2811	2825	2803.7	2749	2823	2720	2764.0
2	1.25	2998	2952	2995	2981.7	3004	2999	2980	2994.3
3	2.31	3073	3095	3068	3078.7	3135	3088	3125	3116.0
4	3.85	3015	3047	3046	3036.0	3071	3061	3085	3072.3
Center	5.96	2984	2972	3002	2986.0	2968	2951	2981	2966.7
5	8.07	2951	2969	2986	2968.7	2921	2917	2893	2910.3
6	9.61	2963	2980	2957	2966.7	2844	2846	2854	2848.0
7	10.67	2863	2909	2981	2917.7	2742	2745	2734	2740.3
8	11.42	2710	2742	2705	2719.0	2616	2631	2605	2617.3
Averages ---------->		2925.8	2941.9	2951.7	2939.8	2894.4	2895.7	2886.3	2892.1

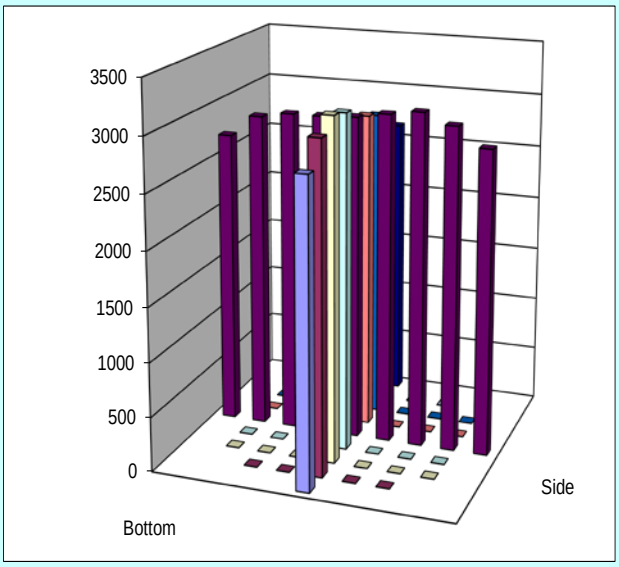
All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	2916.0		Mean	2990.8	2949.7	2970.2
Min Point	2617.3	-10.2%	Std. Dev.	52.1	129.6	97.2
Max Point	3116.0	6.9%	COV as %	1.7	4.4	**3.3**

Flow w/o C-Pt 2255 acfm

Vel Avg w/o C-Pt 2908 afpm

	Start	Finish	
Stack temp	42.6	43.2	F
Equipment temp	NA	NA	F
Ambient temp	18.7	17.1	C
Stack static	NA	NA	mbars
Ambient pressure	29.97	29.97	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	31.4%	38.2%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes:

CA 1/12/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/12/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Remedial Scale Model**	Run No.	**VT-11**
Date	**1/13/15**	Fan Configuration	**Fan AB Min**
Testers	CA, EA	Fan Setting	**19** **Hz**
Stack Dia.	11.922 in.	Stack Temp	38.3 deg F
Stack X-Area	111.6 in.2	Start/End Time	847/912
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

Order -->		1				2			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	1464	1463	1500	1475.7	1445	1457	1456	1452.7
2	1.25	1622	1569	1658	1616.3	1616	1617	1632	1621.7
3	2.31	1653	1657	1633	1647.7	1673	1680	1675	1676.0
4	3.85	1632	1631	1651	1638.0	1645	1689	1661	1665.0
Center	5.96	1607	1612	1619	1612.7	1606	1631	1597	1611.3
5	8.07	1588	1595	1608	1597.0	1567	1598	1580	1581.7
6	9.61	1577	1562	1556	1565.0	1525	1547	1488	1520.0
7	10.67	1534	1514	1519	1522.3	1464	1508	1425	1465.7
8	11.42	1408	1408	1430	1415.3	1354	1353	1357	1354.7
Averages ---------->		1565.0	1556.8	1574.9	1565.6	1543.9	1564.4	1541.2	1549.9

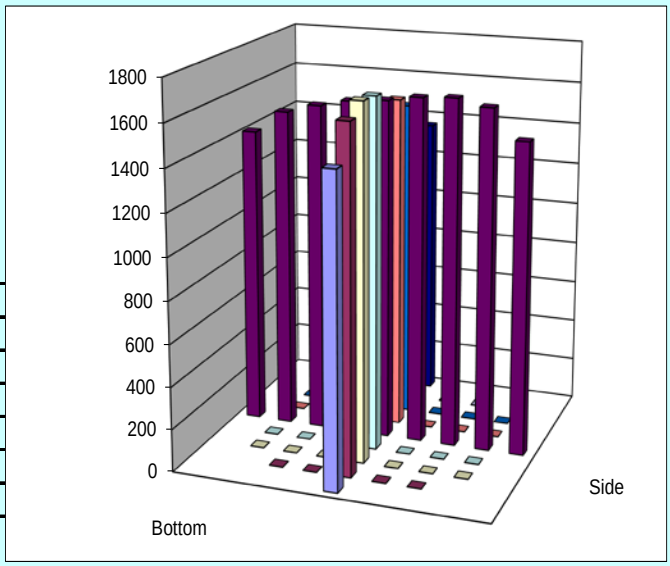
All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	1557.7		Mean	1599.9	1591.6	1595.7
Min Point	1354.7	-13.0%	Std. Dev.	43.6	76.3	59.8
Max Point	1676.0	7.6%	COV as %	2.7	4.8	**3.7**

Flow w/o C-Pt 1202 acfm

Vel Avg w/o C-Pt 1551 afpm

	Start	Finish	
Stack temp	38	38.5	F
Equipment temp	NA	NA	F
Ambient temp	15.4	14.6	C
Stack static	NA	NA	mbars
Ambient pressure	30.13	30.13	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	42.6%	43.5%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes:

CA 1/13/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/13/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Remedial Scale Model**	Run No.	**VT-12**
Date	**1/13/15**	Fan Configuration	**Fan A Max**
Testers	CA, EA	Fan Setting	**51.2** **Hz**
Stack Dia.	11.922 in.	Stack Temp	40.0 deg F
Stack X-Area	111.6 in.2	Start/End Time	914/946
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

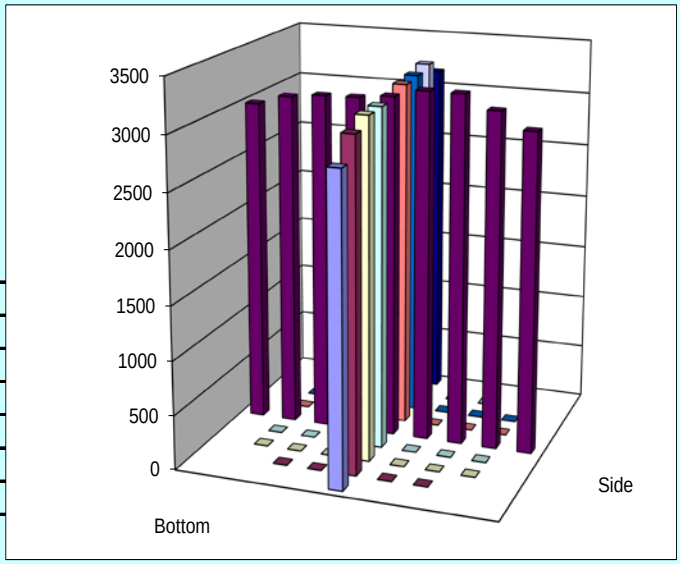
Order -->		2				1			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	2970	2913	2961	2948.0	2819	2841	2802	2820.7
2	1.25	3117	3134	3059	3103.3	3080	3000	3020	3033.3
3	2.31	3225	3238	3233	3232.0	3130	3113	3133	3125.3
4	3.85	3243	3235	3224	3234.0	3143	3126	3136	3135.0
Center	5.96	3158	3169	3156	3161.0	3212	3147	3114	3157.7
5	8.07	3146	3128	3113	3129.0	3250	3186	3180	3205.3
6	9.61	3101	3129	3140	3123.3	3232	3252	3203	3229.0
7	10.67	3063	3069	3139	3090.3	3166	3318	3339	3274.3
8	11.42	2934	3053	3023	3003.3	3155	3218	3064	3145.7
Averages ---------->		3106.3	3118.7	3116.4	3113.8	3131.9	3133.4	3110.1	3125.1

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	3119.5		Mean	3153.3	3165.7	3159.5
Min Point	2820.7	-9.6%	Std. Dev.	58.8	79.1	67.2
Max Point	3274.3	5.0%	COV as %	1.9	2.5	**2.1**

Flow w/o C-Pt	2414	acfm
Vel Avg w/o C-Pt	3115	afpm

	Start	Finish	
Stack temp	39.6	40.3	F
Equipment temp	NA	NA	F
Ambient temp	15.7	14.6	C
Stack static	NA	NA	mbars
Ambient pressure	30.14	30.14	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	39.9%	42.8%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro	
Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes:

CA 1/13/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/13/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Remedial Scale Model**	Run No.	**VT-13**
Date	**1/13/15**	Fan Configuration	**Fan A Min**
Testers	CA, EA	Fan Setting	**27** **Hz**
Stack Dia.	11.922 in.	Stack Temp	40.6 deg F
Stack X-Area	111.6 in.2	Start/End Time	1340 / 1402
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

Order -->		1				2			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	1529	1496	1512	1512.3	1459	1449	1423	1443.7
2	1.25	1616	1621	1595	1610.7	1553	1548	1535	1545.3
3	2.31	1681	1673	1665	1673.0	1586	1588	1597	1590.3
4	3.85	1684	1678	1696	1686.0	1618	1612	1613	1614.3
Center	5.96	1635	1642	1630	1635.7	1602	1587	1623	1604.0
5	8.07	1591	1595	1576	1587.3	1615	1615	1620	1616.7
6	9.61	1558	1554	1546	1552.7	1626	1601	1613	1613.3
7	10.67	1525	1558	1547	1543.3	1573	1591	1573	1579.0
8	11.42	1426	1444	1449	1439.7	1510	1500	1506	1505.3
Averages ---------->		1582.8	1584.6	1579.6	1582.3	1571.3	1565.7	1567.0	1568.0

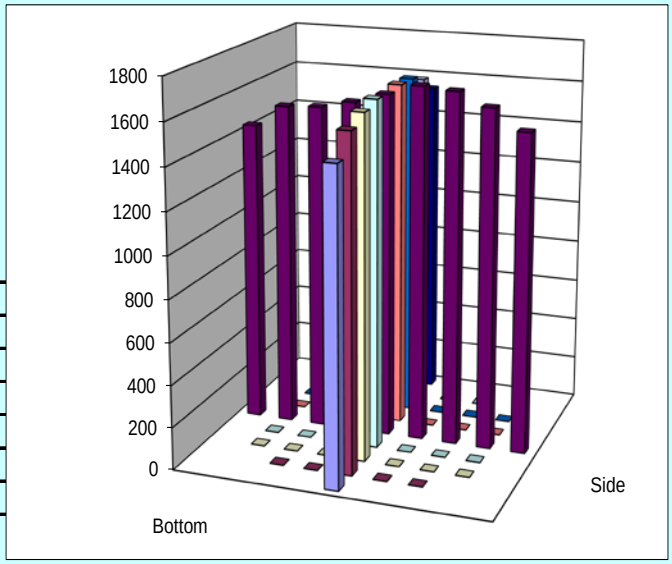
All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	1575.1		Mean	1612.7	1594.7	1603.7
Min Point	1439.7	-8.6%	Std. Dev.	55.7	25.8	42.7
Max Point	1686.0	7.0%	COV as %	3.5	1.6	**2.7**

Flow w/o C-Pt 1217 acfm

Vel Avg w/o C-Pt 1570 afpm

	Start	Finish	
Stack temp	40.3	40.9	F
Equipment temp	NA	NA	F
Ambient temp	14.4	15.7	C
Stack static	NA	NA	mbars
Ambient pressure	30.11	30.11	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	40.5%	41.1%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro	
Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes:

CA 1/13/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/13/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Remedial Scale Model**	Run No.	**VT-14**
Date	**1/13/15**	Fan Configuration	**Fan A Min**
Testers	CA, EA	Fan Setting	**27** **Hz**
Stack Dia.	11.922 in.	Stack Temp	41.1 deg F
Stack X-Area	111.6 in.2	Start/End Time	1405 / 1430
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

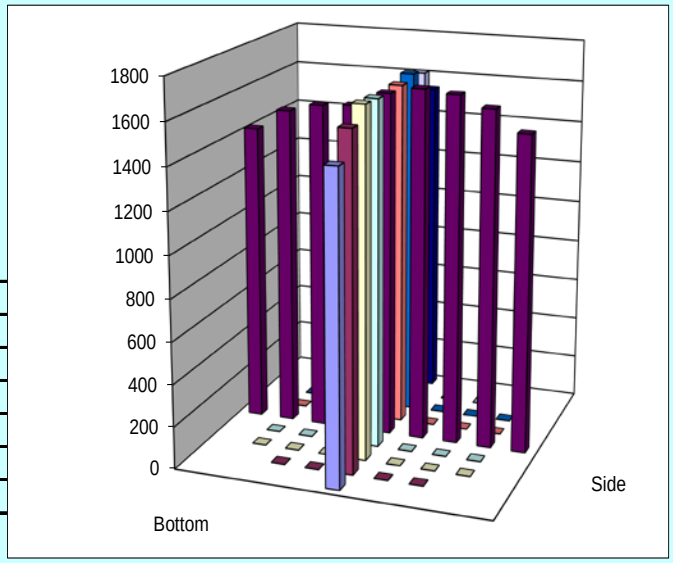
Order -->		2				1			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	1517	1510	1482	1503.0	1433	1426	1402	1420.3
2	1.25	1626	1590	1597	1604.3	1546	1539	1545	1543.3
3	2.31	1645	1655	1671	1657.0	1606	1618	1614	1612.7
4	3.85	1663	1668	1686	1672.3	1592	1625	1595	1604.0
Center	5.96	1628	1664	1626	1639.3	1620	1579	1586	1595.0
5	8.07	1516	1606	1589	1570.3	1607	1597	1599	1601.0
6	9.61	1572	1575	1533	1560.0	1621	1621	1629	1623.7
7	10.67	1511	1545	1510	1522.0	1597	1591	1607	1598.3
8	11.42	1430	1417	1424	1423.7	1502	1480	1489	1490.3
Averages ---------->		1567.6	1581.1	1568.7	1572.4	1569.3	1564.0	1562.9	1565.4

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	1568.9		Mean	1603.6	1596.9	1600.2
Min Point	1420.3	-9.5%	Std. Dev.	55.6	25.5	41.7
Max Point	1672.3	6.6%	COV as %	3.5	1.6	**2.6**

Flow w/o C-Pt	1212	acfm
Vel Avg w/o C-Pt	1563	afpm

	Start	Finish	
Stack temp	41.1	41	F
Equipment temp	NA	NA	F
Ambient temp	15.7	14.7	C
Stack static	NA	NA	mbars
Ambient pressure	30.11	30.12	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	41.1%	45.5%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes:

CA 1/13/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/13/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Remedial Scale Model**	Run No.	**VT-15**
Date	**1/13/15**	Fan Configuration	**Fan A Min**
Testers	CA, EA	Fan Setting	**27** **Hz**
Stack Dia.	11.922 in.	Stack Temp	40.9 deg F
Stack X-Area	111.6 in.2	Start/End Time	1432 / 1454
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

Order -->		1				2			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	1517	1524	1531	1524.0	1443	1444	1425	1437.3
2	1.25	1590	1609	1599	1599.3	1526	1529	1565	1540.0
3	2.31	1677	1645	1684	1668.7	1608	1592	1604	1601.3
4	3.85	1683	1676	1664	1674.3	1613	1591	1601	1601.7
Center	5.96	1650	1624	1617	1630.3	1587	1586	1597	1590.0
5	8.07	1577	1573	1588	1579.3	1608	1602	1621	1610.3
6	9.61	1575	1559	1544	1559.3	1633	1616	1607	1618.7
7	10.67	1507	1522	1511	1513.3	1574	1578	1601	1584.3
8	11.42	1397	1408	1472	1425.7	1502	1500	1524	1508.7
Averages ---------->		1574.8	1571.1	1578.9	1574.9	1566.0	1559.8	1571.7	1565.8

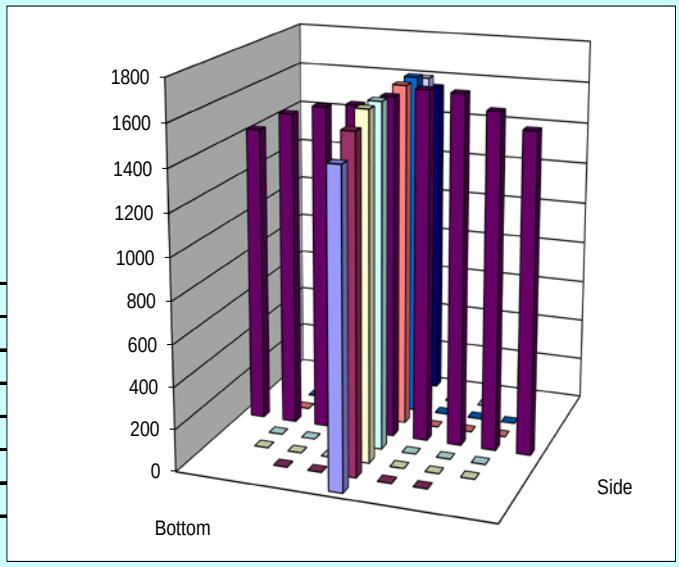
All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	1570.4		Mean	1603.5	1592.3	1597.9
Min Point	1425.7	-9.2%	Std. Dev.	58.7	25.8	43.9
Max Point	1674.3	6.6%	COV as %	3.7	1.6	**2.7**

Flow w/o C-Pt 1214 acfm

Vel Avg w/o C-Pt 1565 afpm

	Start	Finish	
Stack temp	41	40.8	F
Equipment temp	NA	NA	F
Ambient temp	14.7	15.8	C
Stack static	NA	NA	mbars
Ambient pressure	30.12	30.11	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	45.8%	41.8%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes:

CA 1/13/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/13/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

VELOCITY TRAVERSE DATA FORM

Site	**LV-C2 Remedial Scale Model**	Run No.	**VT-16**
Date	**1/13/15**	Fan Configuration	**Fan A Norm**
Testers	CA, EA	Fan Setting	**42** **Hz**
Stack Dia.	11.922 in.	Stack Temp	41.4 deg F
Stack X-Area	111.6 in.2	Start/End Time	1458 / 1521
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Velocity units	aft/min	Data Files:	NA

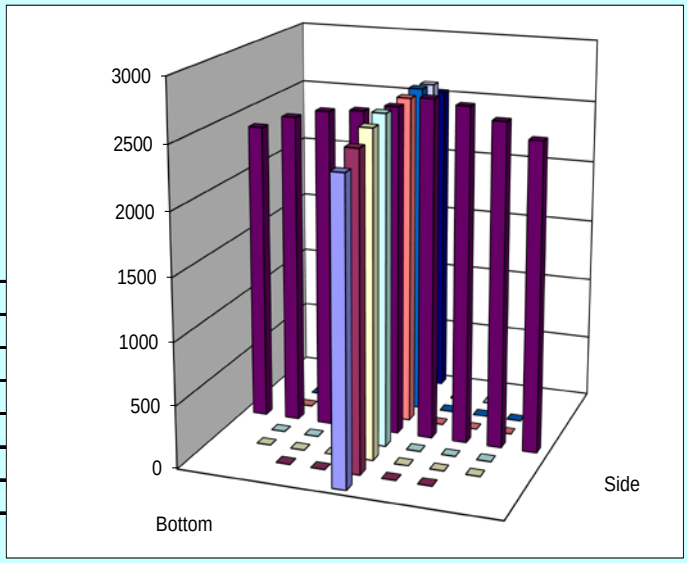
Order -->		2				1			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	Velocity				Velocity			
1	0.50	2467	2426	2473	2455.3	2340	2378	2345	2354.3
2	1.25	2569	2599	2570	2579.3	2456	2469	2469	2464.7
3	2.31	2665	2700	2659	2674.7	2547	2565	2547	2553.0
4	3.85	2706	2733	2697	2712.0	2591	2600	2617	2602.7
Center	5.96	2630	2631	2624	2628.3	2657	2560	2565	2594.0
5	8.07	2551	2562	2614	2575.7	2625	2598	2597	2606.7
6	9.61	2547	2537	2571	2551.7	2620	2630	2631	2627.0
7	10.67	2464	2470	2521	2485.0	2575	2658	2589	2607.3
8	11.42	2366	2386	2399	2383.7	2492	2526	2463	2493.7
Averages ---------->		2551.7	2560.4	2569.8	2560.6	2544.8	2553.8	2535.9	2544.8

All	ft/min	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	2552.7		Mean	2601.0	2579.3	2590.1
Min Point	2354.3	-7.8%	Std. Dev.	76.9	55.4	65.4
Max Point	2712.0	6.2%	COV as %	3.0	2.1	**2.5**

Flow w/o C-Pt	1973	acfm
Vel Avg w/o C-Pt	2545	afpm

	Start	Finish	
Stack temp	41.8	40.9	F
Equipment temp	NA	NA	F
Ambient temp	18	15	C
Stack static	NA	NA	mbars
Ambient pressure	30.11	30.11	in Hg
Total Stack pressure	NA	NA	mbars
Ambient humidity	34.8%	42.4%	RH

Instuments Used:	Cal Due
Fisher Scientific Barometer Hydro Therm/Baro/Dew Point Pen 122277883	8/7/2015
TSI VelociCalc SN T95351203001	8/15/2015



Notes:

CA 1/13/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/13/2015	Signature/date	3/20/2015
	Signature on file with original		Signature on file n TI-WTPSP-136

C.2 LV-C2 Flow Angle Data Sheets

FLOW ANGLE DATA FORM

Site	**LV-C2 -Remedial Scale Model**	Run No.	**FA-1**
Date	1/14/2015	Fan Setting	**51.2** Hz
Tester	CA, EA	Fan configuration	**Fan A Max**
Stack Dia.	11.922 in	Approx. air vel.	3266 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
ınce to disturbance	119.88 in	Stack Temp	39.9 F
Start/End Time	1100/1138		

		Side				Bottom			
Order -->		2				1			
Traverse-->									
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	1	0	0	0.3	-5	-1	-2	-2.7
2	1.25	2	3	3	2.7	-1	-1	0	-0.7
3	2.31	3	3	3	3.0	-1	-14	-1	-5.3
4	3.85	-6	-6	-6	-6.0	-5	-9	-8	-7.3
Cente	5.96	-6	-6	-7	-6.3	-6	-8	-7	-7.0
5	8.07	-4	-3	-4	-3.7	-5	-5	-5	-5.0
6	9.61	-1	-1	-1	-1.0	-5	-3	-2	-3.3
7	10.67	1	2	2	1.7	-3	-1	-3	-2.3
8	11.42	2	1	3	2.0	-2	-1	-1	-1.3
Mean of absolute values:					3.0				3.9
" " w/o points by wall:					3.5				4.4

Grand mean ABS	3.4
" " w/o wall pts	4.0

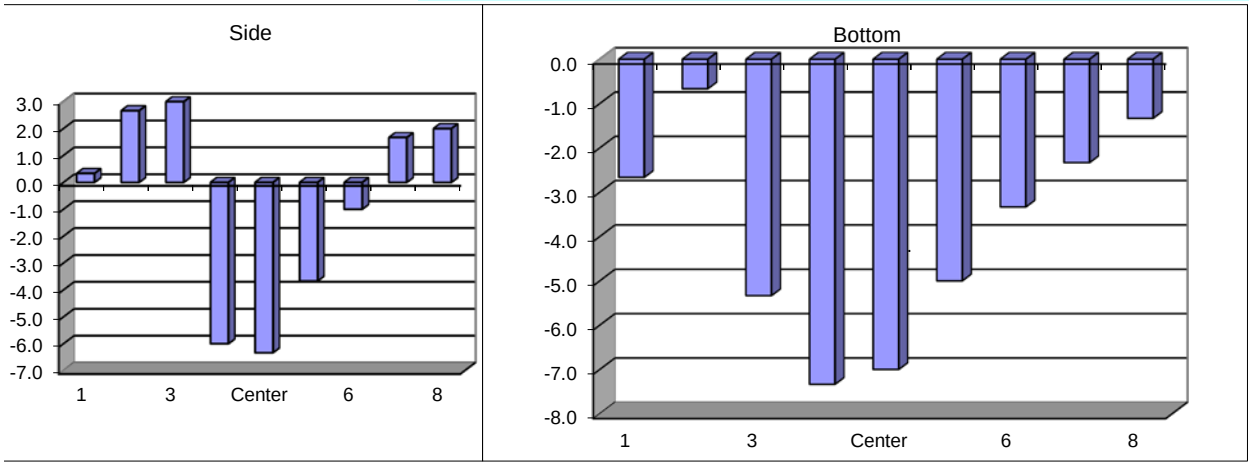
Instuments Used:			**Cal. Due**	
S-typ	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

Notes Velocity and temp measured at center, side.

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

CA

1/14/2015



Entries made by: Carmen Arimescu	Technical Data Review performed by: John Glissmeyer
Signature/date 1/14/2015	Signature/date 2/20/2015
Signature on file with original	Signature on file in TI-WTPSP-135

FLOW ANGLE DATA FORM

Site	**LV-C2 -Remedial Scale Model**	Run No.	**FA-2**
Date	1/14/2015	Fan Setting	**51.2** Hz
Tester	CA, EA	Fan configuration	**Fan A Max**
Stack Dia.	11.922 in	Approx. air vel.	3253 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	41.1 F
Start/End Time	115 / 153		

Order -->		1				2			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	2	-2	-2	-0.7	0	0	0	0.0
2	1.25	4	5	4	4.3	4	3	3	3.3
3	2.31	2	2	0	1.3	3	3	3	3.0
4	3.85	-8	-8	-8	-8.0	-5	-2	-5	-4.0
Center	5.96	-8	-7	-8	-7.7	-3	-4	-5	-4.0
5	8.07	-4	-2	-4	-3.3	0	-1	-1	-0.7
6	9.61	0	0	-1	-0.3	3	1	1	1.7
7	10.67	1	2	1	1.3	2	2	2	2.0
8	11.42	3	1	2	2.0	2	2	1	1.7
Mean of absolute values:					3.2				2.3
" " w/o points by wall:					3.8				2.7

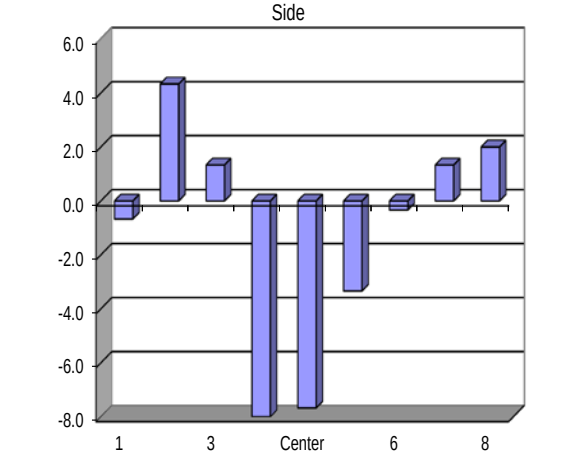
Grand mean ABS	2.7
" " w/o wall pts	3.2

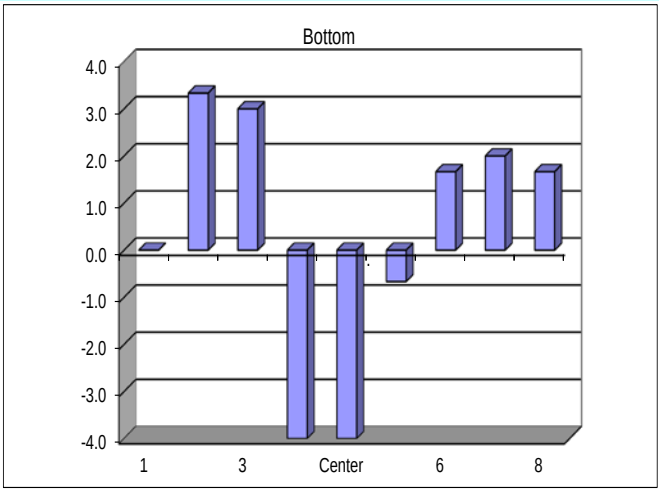
Instuments Used:			**Cal. Due**	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	Man 5	Cat. 3	4/4/2015

Notes: Velocity - Side - Center

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

CA
1/14/2015





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/14/2015	Signature/date	2/20/2015
	Signature on file with original		Signature on file in TI-WTPSP-135

ANGLE DATA FORM

Site	**LV-C2 -Remedial Scale Model**	Run No.	**FA-3**
Date	1/14/2015	Fan Setting	**51.2** Hz
Tester	CA, EA	Fan configuration	**Fan A Max**
Stack Dia.	11.922 in	Approx. air vel.	3144 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	41.4 F
Start/End Time	200 / 220		

Order -->		2				1			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	0	0	0	0.0	-1	0	0	-0.3
2	1.25	2	4	4	3.3	3	5	3	3.7
3	2.31	2	2	3	2.3	3	4	2	3.0
4	3.85	-3	-3	-4	-3.3	-5	-7	-6	-6.0
Center	5.96	-3	-4	-3	-3.3	-7	-6	6	-2.3
5	8.07	0	0	-1	-0.3	-3	-3	-4	-3.3
6	9.61	1	2	2	1.7	-1	-1	-2	-1.3
7	10.67	2	2	2	2.0	4	1	1	2.0
8	11.42	4	3	3	3.3	1	2	2	1.7
Mean of absolute values:					2.2				2.6
" " w/o points by wall:					2.3				3.1
								Grand mean ABS	2.4
								" " w/o wall pts	2.7

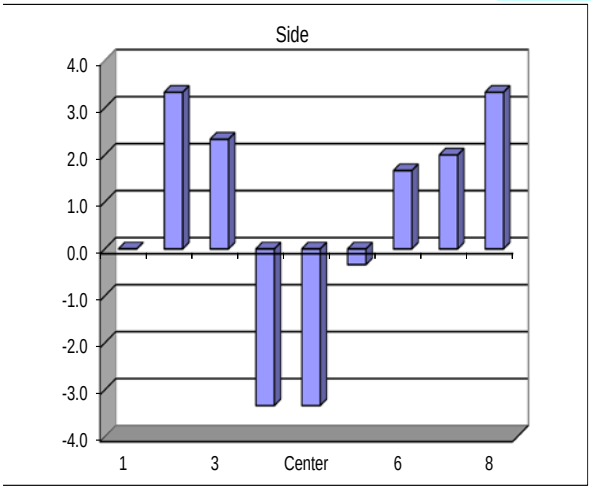
Instuments Used:			**Cal. Due**	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	Man 5	Cat. 3	4/4/2015

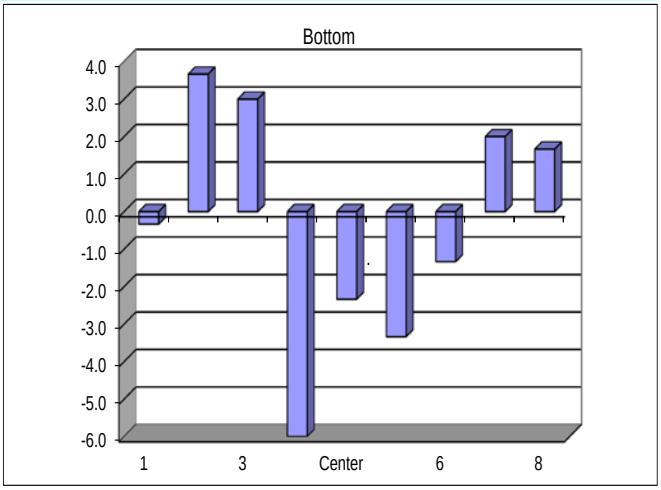
Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA

1/14/2015





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/14/2015	Signature/date	2/20/2015
	Signature on file with original		Signature on file in TI-WTPSP-135

ANGLE DATA FORM

Site	**LV-C2 -Remedial Scale Model**	Run No.	**FA-4**
Date	1/15/2015	Fan Setting	**42** Hz
Tester	CA, EA	Fan configuration	**Fan A Norm**
Stack Dia.	11.922 in	Approx. air vel.	2797 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	39.4 F
Start/End Time	903 / 923		

Order -->		1				2			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	0	0	-1	-0.3	0	0	0	0.0
2	1.25	3	1	2	2.0	0	0	0	0.0
3	2.31	0	0	0	0.0	0	0	0	0.0
4	3.85	-7	-8	-7	-7.3	-5	-4	-5	-4.7
Center	5.96	-9	-9	-9	-9.0	-4	-4	-6	-4.7
5	8.07	-6	-7	-7	-6.7	-3	-2	-1	-2.0
6	9.61	-3	-3	-3	-3.0	-1	-1	-1	-1.0
7	10.67	-1	-1	-2	-1.3	1	-1	0	0.0
8	11.42	-1	-1	1	-0.3	2	1	2	1.7
Mean of absolute values:					3.3				1.6
" " w/o points by wall:					4.2				1.8
								Grand mean ABS	2.4
								" " w/o wall pts	3.0

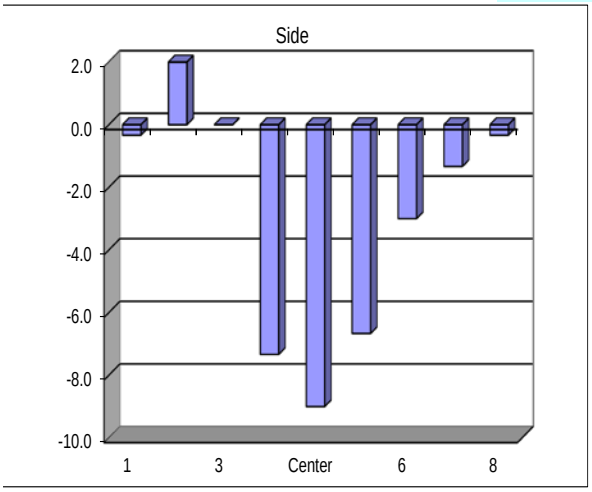
Instuments Used:			**Cal. Due**	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

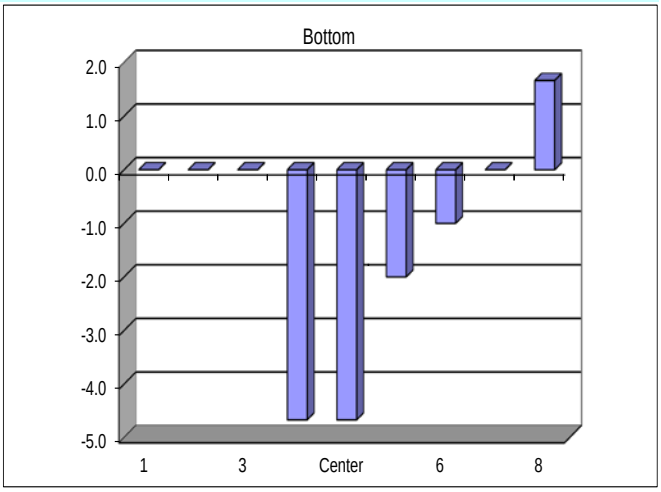
Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA

1/15/2015





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/15/2015	Signature/date	2/20/2015
	Signature on file with Original		Signature on file in TI-WTPSP-135

ANGLE DATA FORM

Site	LV-C2 -Remedial Scale Model	Run No.	FA-5
Date	1/15/2015	Fan Setting	40 Hz
Tester	CA, EA	Fan configuration	Fan A Norm
Stack Dia.	11.922 in	Approx. air vel.	2530 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	40 F
Start/End Time	930 / 1003		

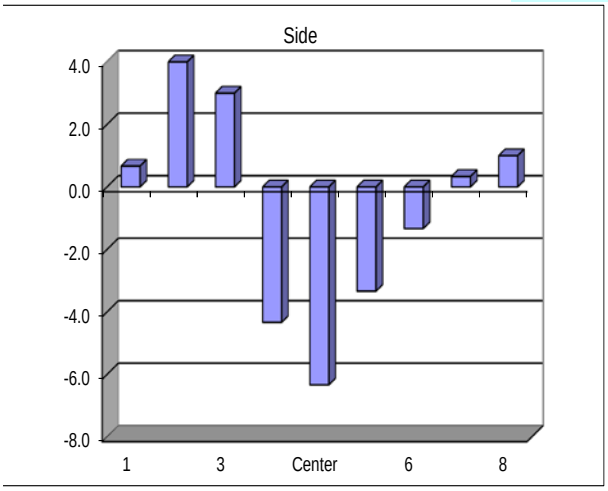
Order -->		2				1			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	0	2	0	0.7	0	0	0	0.0
2	1.25	6	3	3	4.0	2	1	1	1.3
3	2.31	3	3	3	3.0	2	0	0	0.7
4	3.85	-3	-5	-5	-4.3	-5	-7	-5	-5.7
Center	5.96	-7	-7	-5	-6.3	-4	-4	-4	-4.0
5	8.07	-4	-3	-3	-3.3	-2	-2	-3	-2.3
6	9.61	-2	-1	-1	-1.3	-1	-2	-2	-1.7
7	10.67	0	0	1	0.3	-1	0	1	0.0
8	11.42	0	0	3	1.0	1	2	0	1.0
Mean of absolute values:					2.7				1.9
" " w/o points by wall:					3.2				2.2
								Grand mean ABS	2.3
								" " w/o wall pts	2.7

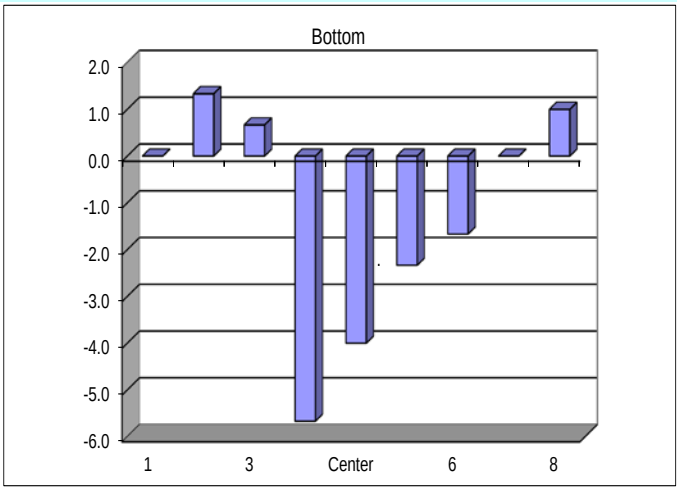
Instuments Used:			Cal. Due	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA
1/15/2015





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/15/2015	Signature/date	2/20/2015
	Signature on file with Original		Signature on file in TI-WTPSP-135

ANGLE DATA FORM

Site	LV-C2 -Remedial Scale Model	Run No.	FA-6
Date	1/15/2015	Fan Setting	40 Hz
Tester	CA, EA	Fan configuration	Fan A Norm
Stack Dia.	11.922 in	Approx. air vel.	2496 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	41.5 F
Start/End Time	1010 / 1034		

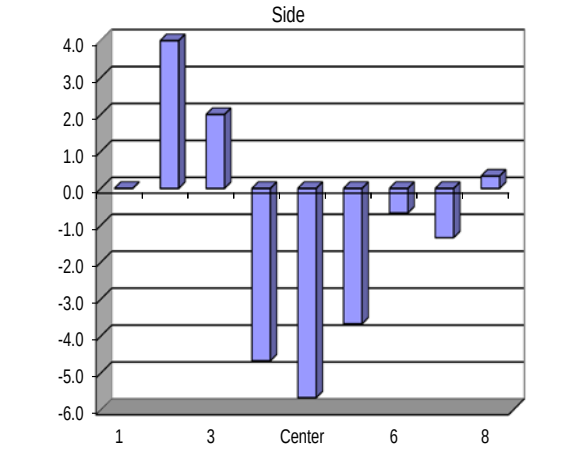
Order -->		1				2			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	0	0	0	0.0	0	0	0	0.0
2	1.25	4	3	5	4.0	3	4	4	3.7
3	2.31	2	2	2	2.0	3	0	0	1.0
4	3.85	-4	-5	-5	-4.7	-3	-5	-6	-4.7
Center	5.96	-6	-6	-5	-5.7	-4	-3	-7	-4.7
5	8.07	-4	-4	-3	-3.7	-2	-3	-4	-3.0
6	9.61	0	-1	-1	-0.7	0	0	-1	-0.3
7	10.67	-1	-1	-2	-1.3	1	2	0	1.0
8	11.42	1	-1	1	0.3	1	1	2	1.3
Mean of absolute values:					2.5				2.2
" " w/o points by wall:					3.1				2.6
								Grand mean ABS	2.3
								" " w/o wall pts	2.9

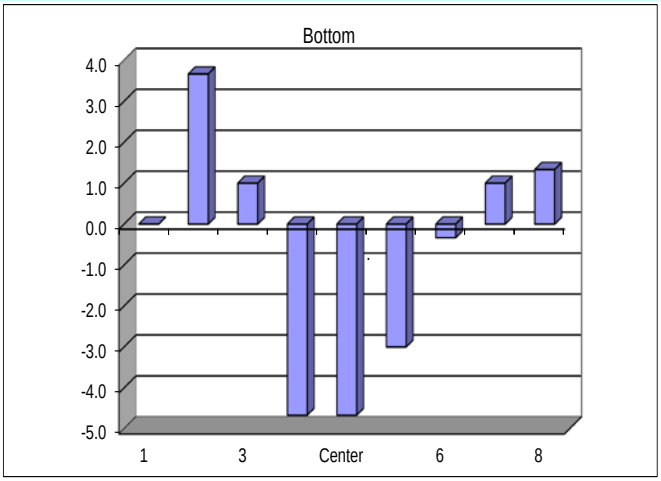
Instuments Used:			Cal. Due	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA
1/15/2015





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/15/2015	Signature/date	2/20/2015
	Signature on file with Original		Signature on file in TI-WTPSP-135

ANGLE DATA FORM

Site	LV-C2 -Remedial Scale Model	Run No.	FA-7
Date	1/15/2015	Fan Setting	27 Hz
Tester	CA, EA	Fan configuration	Fan A Min
Stack Dia.	11.922 in	Approx. air vel.	1647 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	41.5 F
Start/End Time	1047 / 1102		

Order -->		2				1				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3		1	2	3		
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.	
1	0.50	0	0	0	0.0	0	0	0	0.0	
2	1.25	4	1	2	2.3	3	4	5	4.0	
3	2.31	3	2	2	2.3	0	0	0	0.0	
4	3.85	0	0	0	0.0	-1	-3	0	-1.3	
Center	5.96	-6	-5	-6	-5.7	-3	-5	-5	-4.3	
5	8.07	-3	-4	-4	-3.7	-4	-3	-2	-3.0	
6	9.61	-1	-2	-3	-2.0	0	-2	-1	-1.0	
7	10.67	-1	-1	-2	-1.3	2	0	1	1.0	
8	11.42	0	-2	-2	-1.3	3	0	2	1.7	
Mean of absolute values:					2.1				1.8	
" " w/o points by wall:					2.5				2.1	
								Grand mean ABS	1.9	
								" " w/o wall pts	2.3	

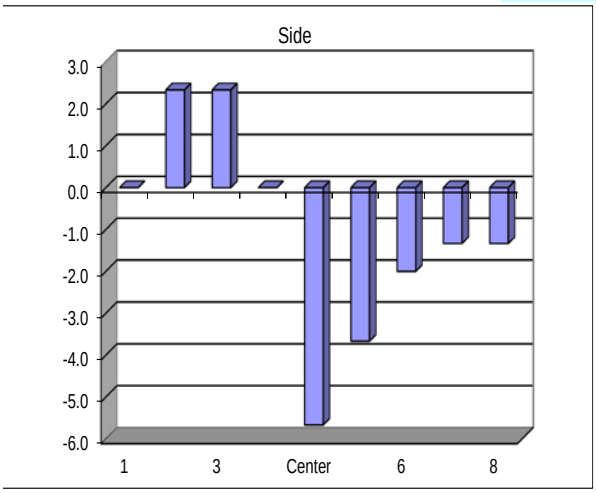
Instuments Used:			Cal. Due	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

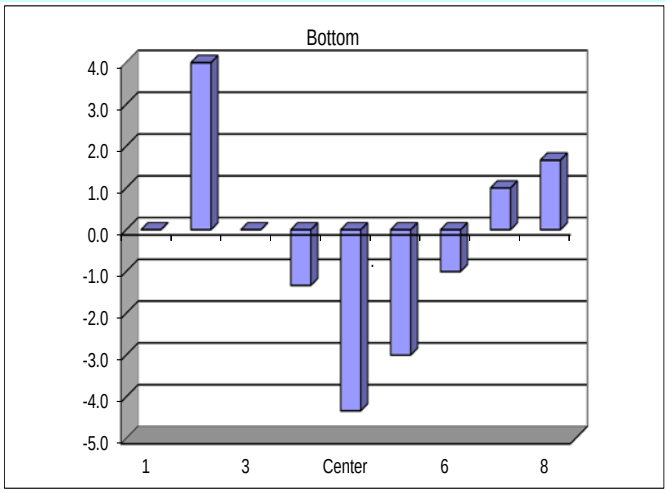
Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA

1/15/2015





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/15/2015	Signature/date	2/20/2015
	Signature on file with Original		Signature on file in TI-WTPSP-135

ANGLE DATA FORM

Site	LV-C2 -Remedial Scale Model	Run No.	FA-8
Date	1/19/2015	Fan Setting	56.2 Hz
Tester	CA,JAG	Fan configuration	Fan B Max
Stack Dia.	11.922 in	Approx. air vel.	3156 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	60.6 F
Start/End Time	1400/1442		

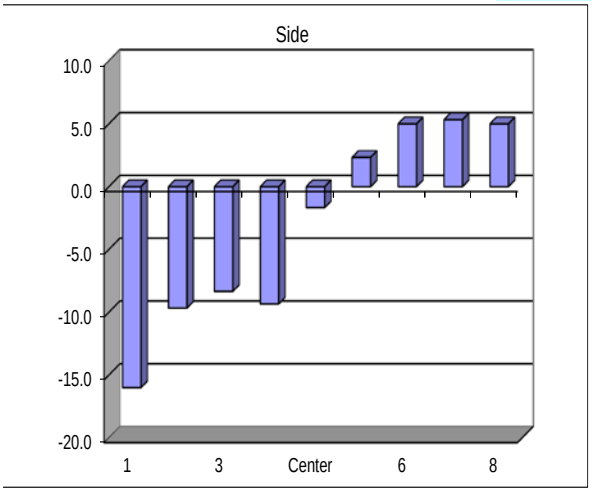
Order -->		1				2				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3		1	2	3		
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.	
1	0.50	-17	-15	-16	-16.0	-8	-8	-6	-7.3	
2	1.25	-10	-10	-9	-9.7	-6	-5	-2	-4.3	
3	2.31	-10	-7	-8	-8.3	-7	-5	-3	-5.0	
4	3.85	-9	-8	-11	-9.3	-10	-11	-8	-9.7	
Center	5.96	-2	0	-3	-1.7	-2	-5	-3	-3.3	
5	8.07	2	3	2	2.3	0	-2	2	0.0	
6	9.61	5	5	5	5.0	3	3	5	3.7	
7	10.67	6	5	5	5.3	7	8	10	8.3	
8	11.42	5	5	5	5.0	8	10	13	10.3	
Mean of absolute values:					7.0				5.8	
" " w/o points by wall:					6.0				4.9	
								Grand mean ABS	6.4	
								" " w/o wall pts	5.4	

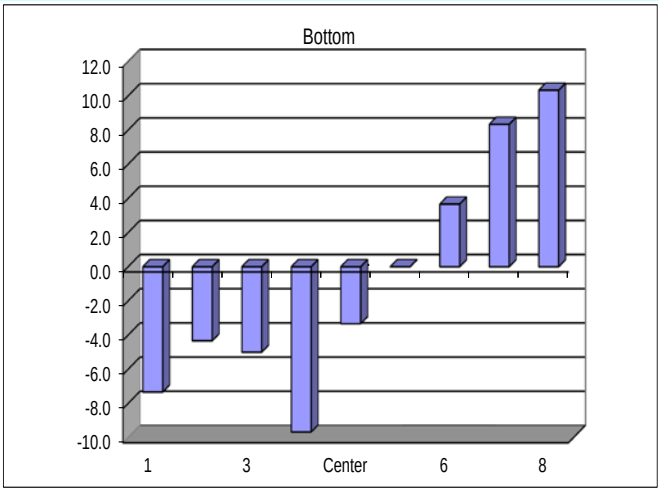
Instuments Used:			Cal. Due	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

Notes: It was windy 14mph-15mph

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

CA
1/19/2015





Entries made by:	Carmen Arimescu
Signature/date	1/19/2015
	Signature on file with Original
Technical Data Review performed by:	Ernest Antonio
Signature/date	3/3/2015
	Signature on file in TI-WTPSP-135

ANGLE DATA FORM

Site	**LV-C2 -Remedial Scale Model**	Run No.	**FA-9**
Date	1/20/2015	Fan Setting	**59** Hz
Tester	CA, EA	Fan configuration	**Fan B Max**
Stack Dia.	11.922 in	Approx. air vel.	3177 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	40.9 F
Start/End Time	930/1017		

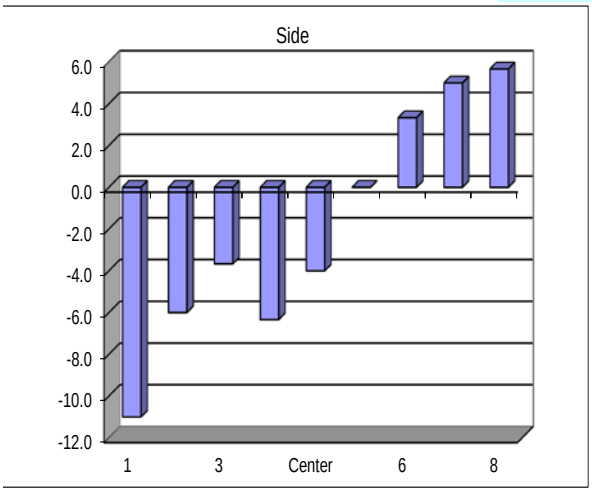
Order -->		2				1				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3		1	2	3		
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.	
1	0.50	-10	-11	-12	-11.0	-8	-1	-5	-4.7	
2	1.25	-6	-6	-6	-6.0	-4	-1	-2	-2.3	
3	2.31	-4	-4	-3	-3.7	-6	-2	-1	-3.0	
4	3.85	-7	-6	-6	-6.3	-5	-3	-3	-3.7	
Center	5.96	-5	-4	-3	-4.0	2	1	1	1.3	
5	8.07	1	0	-1	0.0	4	3	2	3.0	
6	9.61	3	4	3	3.3	6	4	5	5.0	
7	10.67	5	6	4	5.0	8	8	8	8.0	
8	11.42	6	6	5	5.7	7	10	5	7.3	
Mean of absolute values:					5.0				4.3	
" " w/o points by wall:					4.0				3.8	
								Grand mean ABS	4.6	
								" " w/o wall pts	3.9	

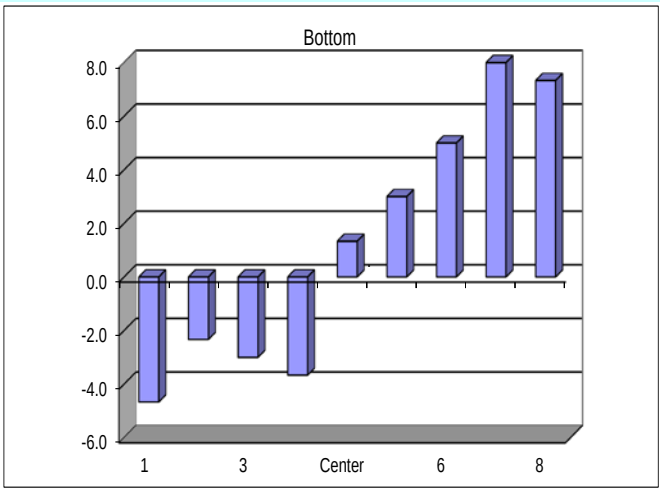
Instuments Used:			**Cal. Due**	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:
This is a repeat of Fan B max ,FA-8, because the particle injection was on.

CA
1/20/2015





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/20/2015	Signature/date	2/20/2015
	Signature on file with Original		Signature on file in TI-WTPSP-135

ANGLE DATA FORM

Site	**LV-C2 -Remedial Scale Model**	Run No.	**FA-10**
Date	1/20/2015	Fan Setting	**47.1** Hz
Tester	CA, EA	Fan configuration	**Fan B Norm**
Stack Dia.	11.922 in	Approx. air vel.	2567 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	43.8 F
Start/End Time	1020/1045		

Order -->	1				2			
Traverse-->	**Side**				**Bottom**			
Trial ---->	1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	-12	-13	-13	-12.7	-3	-3	-3	-3.0
2	1.25	-8	-8	-9	-8.3	-2	-3	-2	-2.3
3	2.31	-5	-6	-5	-5.3	-3	-2	-3	-2.7
4	3.85	-7	-7	-8	-7.3	-5	-3	-5	-4.3
Center	5.96	-4	-6	-5	-5.0	-1	-1	-1	-1.0
5	8.07	-1	-1	-1	-1.0	2	1	2	1.7
6	9.61	2	2	2	2.0	4	4	4	4.0
7	10.67	3	4	4	3.7	5	6	7	6.0
8	11.42	5	4	4	4.3	5	5	5	5.0
Mean of absolute values:					5.5				3.3
" " w/o points by wall:					4.7				3.1
							Grand mean ABS		4.4
							" " w/o wall pts		3.9

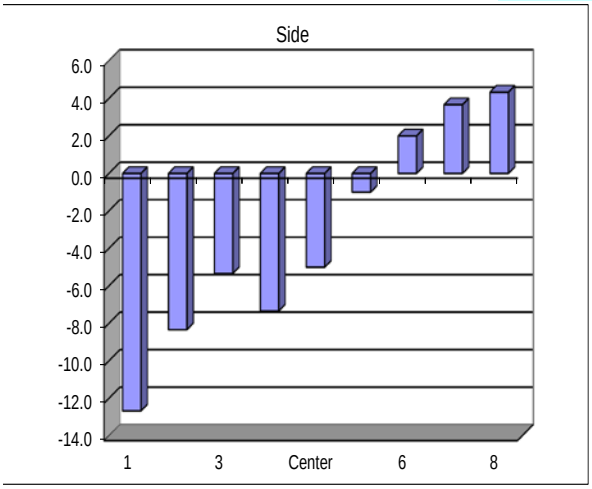
Instuments Used:			**Cal. Due**	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

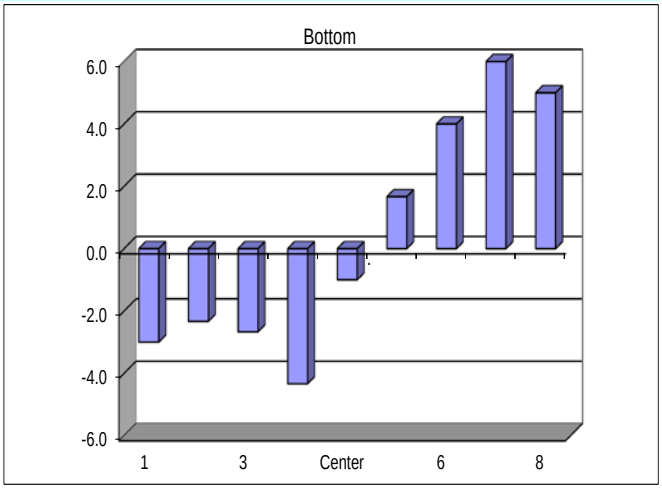
Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA

1/20/2015





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/20/2015	Signature/date	3/2/2015
	Signature on file with Original		Signature on file in TI-WTPSP-135

ANGLE DATA FORM

Site	LV-C2 -Remedial Scale Model	Run No.	FA-11
Date	1/20/2015	Fan Setting	29.5 Hz
Tester	CA, EA	Fan configuration	Fan B Min
Stack Dia.	11.922 in	Approx. air vel.	1547 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	46.4 F
Start/End Time	1050/1112		

Order -->		2				1			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	-8	-9	-8	-8.3	-2	-1	-3	-2.0
2	1.25	-3	-4	-5	-4.0	-2	-1	-3	-2.0
3	2.31	-2	-2	-5	-3.0	-2	-1	-3	-2.0
4	3.85	-4	-3	-6	-4.3	-3	-1	-4	-2.7
Center	5.96	-1	-2	-6	-3.0	-1	-1	-1	-1.0
5	8.07	0	-1	0	-0.3	1	2	2	1.7
6	9.61	2	2	2	2.0	2	4	4	3.3
7	10.67	3	4	4	3.7	8	3	5	5.3
8	11.42	4	7	5	5.3	4	3	6	4.3
Mean of absolute values:					3.8				2.7
" " w/o points by wall:					2.9				2.6
								Grand mean ABS	3.2
								" " w/o wall pts	2.7

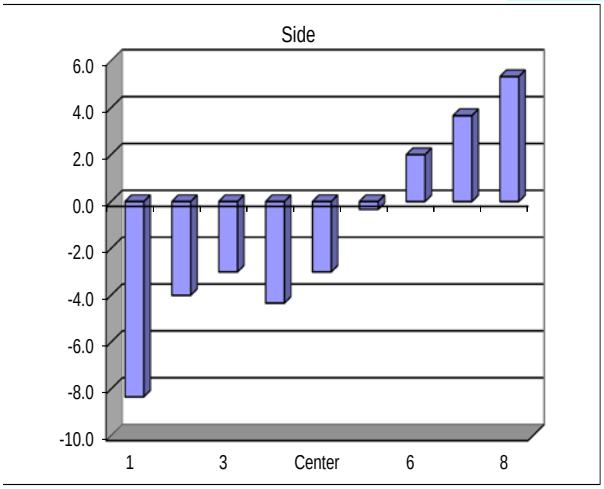
Instuments Used:			Cal. Due	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

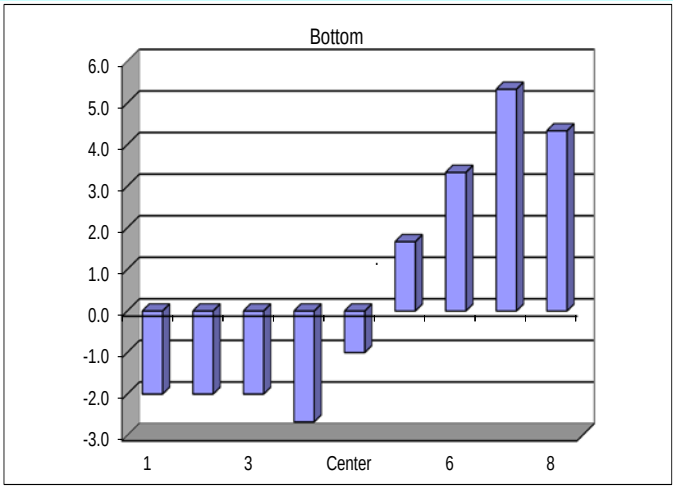
Notes:

CA

1/20/2015

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/20/2015	Signature/date	3/2/2015
	Signature on file with Original		Signature on file in TI-WTPSP-135

ANGLE DATA FORM

Site	**LV-C2 -Remedial Scale Model**	Run No.	**FA-12**
Date	1/20/2015	Fan Setting	**29.5** Hz
Tester	CA, EA	Fan configuration	**Fan B Min**
Stack Dia.	11.922 in	Approx. air vel.	1586 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	52.9 F
Start/End Time	1:20 / 1:46		

Order -->		1				2			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	-9	-14	-11	-11.3	-7	-7	-9	-7.7
2	1.25	-8	-8	-8	-8.0	-9	-7	-8	-8.0
3	2.31	-7	-5	-8	-6.7	-9	-7	-8	-8.0
4	3.85	-7	-7	-10	-8.0	-11	-10	-11	-10.7
Center	5.96	-5	-6	-6	-5.7	-5	-6	-6	-5.7
5	8.07	-3	-2	-2	-2.3	-1	-1	-1	-1.0
6	9.61	1	1	2	1.3	2	1	1	1.3
7	10.67	4	3	2	3.0	2	1	3	2.0
8	11.42	4	5	5	4.7	4	3	3	3.3
Mean of absolute values:					5.7				5.3
" " w/o points by wall:					5.0				5.2
								Grand mean ABS	5.5
								" " w/o wall pts	5.1

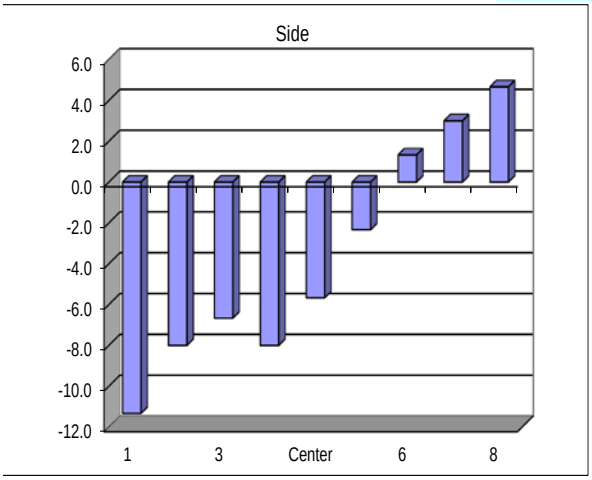
Instuments Used:			**Cal. Due**	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

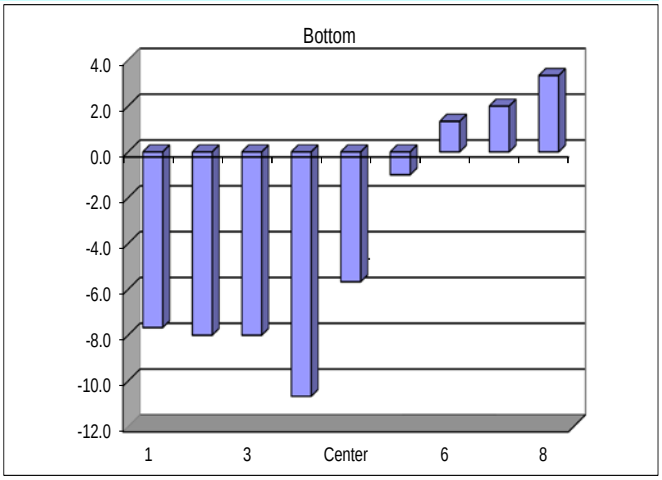
Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA

1/20/2015





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/20/2015	Signature/date	3/2/2015
	Signature on file with Original		Signature on file in TI-WTPSP-135

ANGLE DATA FORM

Site	LV-C2 -Remedial Scale Model	Run No.	FA-13
Date	1/20/2015	Fan Setting	29.5 Hz
Tester	CA, EA	Fan configuration	Fan B Min
Stack Dia.	11.922 in	Approx. air vel.	1556 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	52.8 F
Start/End Time	1345 / 1415		

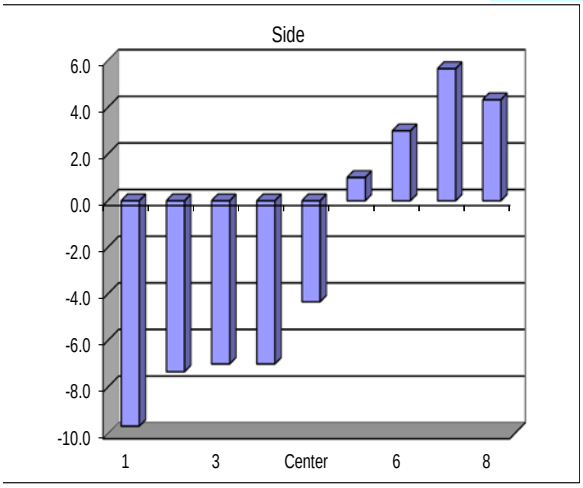
Order -->		2				1				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3		1	2	3		
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.	
1	0.50	-10	-10	-9	-9.7	-7	-7	-8	-7.3	
2	1.25	-10	-6	-6	-7.3	-7	-7	-8	-7.3	
3	2.31	-9	-6	-6	-7.0	-9	-7	-8	-8.0	
4	3.85	-9	-6	-6	-7.0	-10	-9	-10	-9.7	
Center	5.96	-5	-5	-3	-4.3	-5	-5	-7	-5.7	
5	8.07	1	0	2	1.0	-1	-1	-2	-1.3	
6	9.61	2	3	4	3.0	1	0	-1	0.0	
7	10.67	5	6	6	5.7	1	2	2	1.7	
8	11.42	4	5	4	4.3	3	5	3	3.7	
Mean of absolute values:					5.5				5.0	
" " w/o points by wall:					5.0				4.8	
								Grand mean ABS	5.2	
								" " w/o wall pts	4.9	

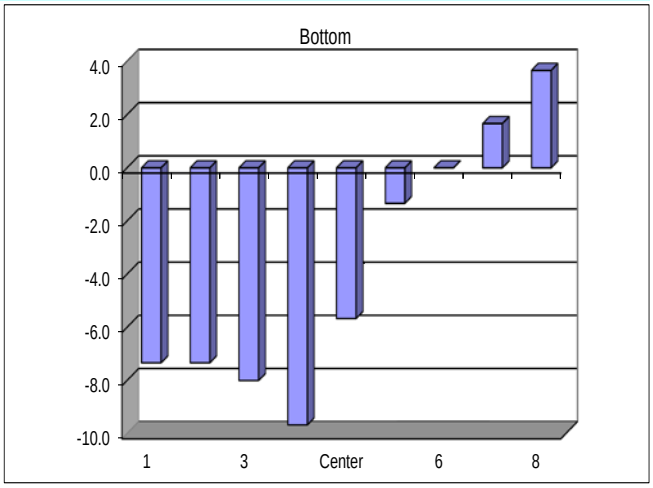
Instuments Used:			Cal. Due	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA
1/20/2015





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/20/2015	Signature/date	3/2/2015
	Signature on file with Original		Signature on file in TI-WTPSP-135

ANGLE DATA FORM

Site	**LV-C2 -Remedial Scale Model**	Run No.	**FA-14**
Date	1/20/2015	Fan Setting	**32** Hz
Tester	CA, EA	Fan configuration	**Fan AB Max**
Stack Dia.	11.922 in	Approx. air vel.	3041 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	50.8 F
Start/End Time	1420 / 1450		

Order -->	1				2			
Traverse-->	**Side**				**Bottom**			
Trial ---->	1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	1	1	1	1.0	5	4	3	4.0
2	1.25	3	3	4	3.3	3	4	3	3.3
3	2.31	3	3	2	2.7	1	2	2	1.7
4	3.85	-6	-6	-4	-5.3	-7	-6	-6	-6.3
Center	5.96	-5	-5	-5	-5.0	-7	-8	-9	-8.0
5	8.07	-2	-4	-4	-3.3	-5	-5	-5	-5.0
6	9.61	-3	-3	-3	-3.0	-2	-3	-3	-2.7
7	10.67	-2	-3	-2	-2.3	-1	-1	-1	-1.0
8	11.42	-1	-3	-3	-2.3	2	2	1	1.7
Mean of absolute values:					3.1				3.7
" " w/o points by wall:					3.6				4.0

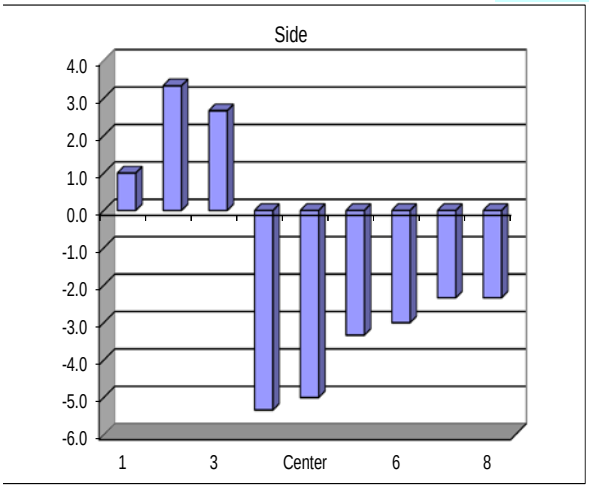
Grand mean ABS	3.4
" " w/o wall pts	3.8

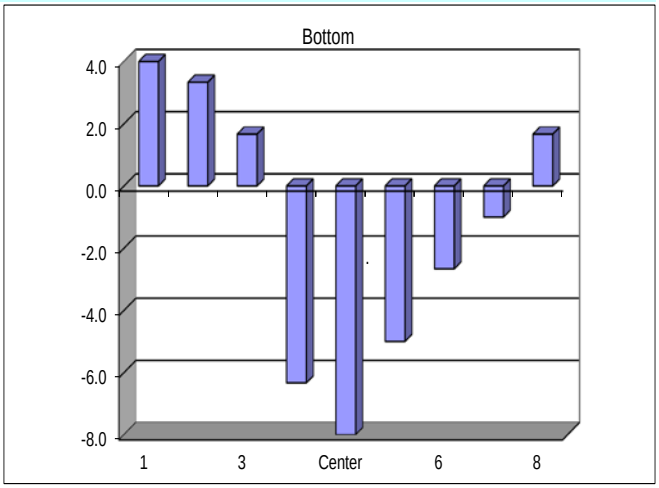
Instuments Used:			**Cal. Due**	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA
1/20/2015





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/20/2015	Signature/date	3/2/2015
	Signature on file with Original		Signature on file in TI-WTPSP-135

ANGLE DATA FORM

Site	LV-C2 -Remedial Scale Model	Run No.	FA-15
Date	1/21/2015	Fan Setting	18 Hz
Tester	CA, EA	Fan configuration	Fan AB Min
Stack Dia.	11.922 in	Approx. air vel.	1582 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	33.9 F
Start/End Time	920/953		

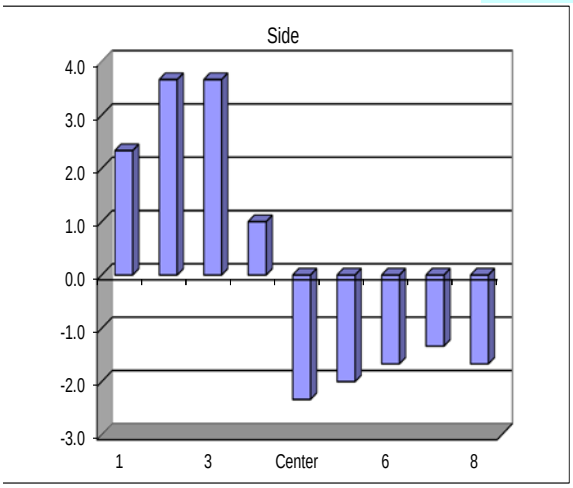
Order -->		2				1				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3		1	2	3		
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.	
1	0.50	1	3	3	2.3	4	3	3	3.3	
2	1.25	4	4	3	3.7	4	5	4	4.3	
3	2.31	4	4	3	3.7	3	3	2	2.7	
4	3.85	2	1	0	1.0	-3	-2	-3	-2.7	
Center	5.96	-2	-2	-3	-2.3	-6	-8	-7	-7.0	
5	8.07	-1	-2	-3	-2.0	-6	-4	-4	-4.7	
6	9.61	-2	-2	-1	-1.7	-4	-4	-2	-3.3	
7	10.67	0	-2	-2	-1.3	0	-1	0	-0.3	
8	11.42	-1	-1	-3	-1.7	0	-1	0	-0.3	
Mean of absolute values:					2.2				3.2	
" " w/o points by wall:					2.2				3.6	
								Grand mean ABS	2.7	
								" " w/o wall pts	2.9	

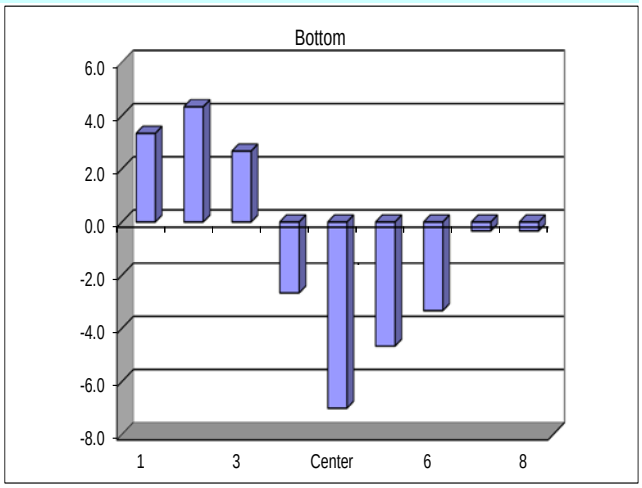
Instuments Used:			Cal. Due	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA
1/21/2015





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/21/2015	Signature/date	3/2/2015
	Signature on file with Original		Signature on file in TI-WTPSP-135

ANGLE DATA FORM

Site	**LV-C2 -Remedial Scale Model**	Run No.	**FA-16**
Date	1/21/2015	Fan Setting	**18** Hz
Tester	CA, EA	Fan configuration	**Fan AB Min**
Stack Dia.	11.922 in	Approx. air vel.	1577 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	33.4 F
Start/End Time	1000/1017		

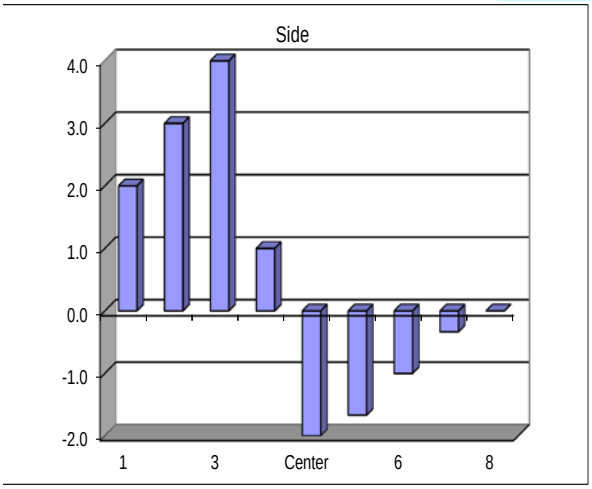
Order -->	1				2			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	2	1	3	2.0	7	7	8	7.3
2	1.25	3	3	3	3.0	7	7	8	7.3
3	2.31	4	4	4	4.0	5	6	6	5.7
4	3.85	1	2	0	1.0	0	0	2	0.7
Center	5.96	-2	-1	-3	-2.0	-4	-4	-4	-4.0
5	8.07	-1	-2	-2	-1.7	-2	-2	-2	-2.0
6	9.61	-2	0	-1	-1.0	-1	1	1	0.3
7	10.67	0	0	-1	-0.3	1	2	3	2.0
8	11.42	0	0	0	0.0	3	4	3	3.3
Mean of absolute values:					1.7				3.6
" " w/o points by wall:					1.9				3.1
							Grand mean ABS		2.6
							" " w/o wall pts		2.5

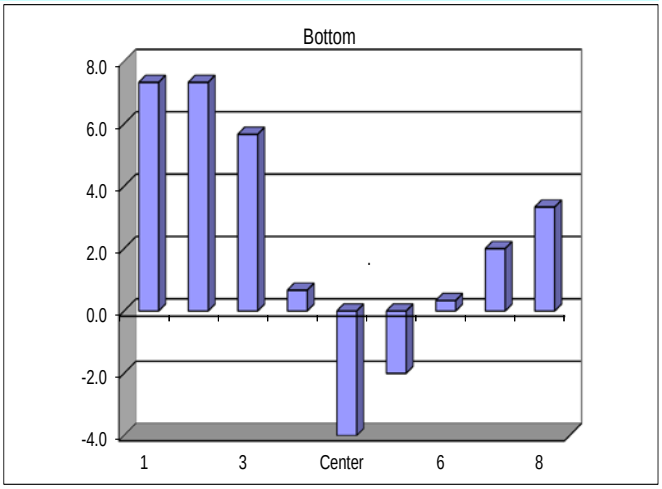
Instuments Used:			**Cal. Due**	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA
1/21/2015





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/21/2015	Signature/date	3/2/2015
	Signature on file with Original		Signature on file in TI-WTPSP-135

FLOW ANGLE DATA FORM

Site	**LV-C2 -Remedial Scale Model**	Run No.	**FA-17**
Date	1/21/2015	Fan Setting	**18** Hz
Tester	CA, EA	Fan configuration	**Fan AB Min**
Stack Dia.	11.922 in	Approx. air vel.	1569 afpm at point >>
Stack X-Area	111.6 in2	Units	degrees (clockwise > pos. nos.)
Elevation	N.A. ft	Port	1
Distance to disturbance	119.88 in	Stack Temp	33.6 F
Start/End Time	1025/1050		

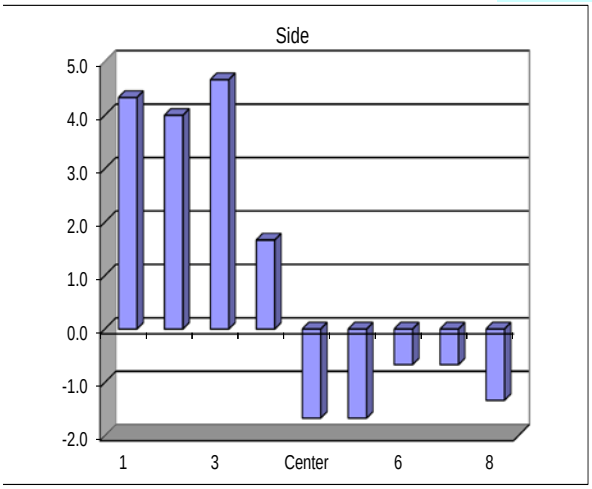
Order -->		2				1			
Traverse-->		**Side**				**Bottom**			
Trial ---->		1	2	3		1	2	3	
Point	Depth, in.	deg. cw	deg. cw	deg. cw	Avg.	deg. cw	deg. cw	deg. cw	Avg.
1	0.50	4	4	5	4.3	8	7	8	7.7
2	1.25	4	4	4	4.0	7	7	7	7.0
3	2.31	5	5	4	4.7	7	6	6	6.3
4	3.85	2	3	0	1.7	2	1	3	2.0
Center	5.96	0	-3	-2	-1.7	-3	-3	-4	-3.3
5	8.07	-2	-2	-1	-1.7	-3	-1	-2	-2.0
6	9.61	-1	-1	0	-0.7	1	0	1	0.7
7	10.67	-1	0	-1	-0.7	3	4	2	3.0
8	11.42	-1	-1	-2	-1.3	3	4	4	3.7
Mean of absolute values:					2.3			afpm at point >>	4.0
" " w/o points by wall:					2.1				3.5
								Grand mean ABS	3.1
								" " w/o wall pts	2.8

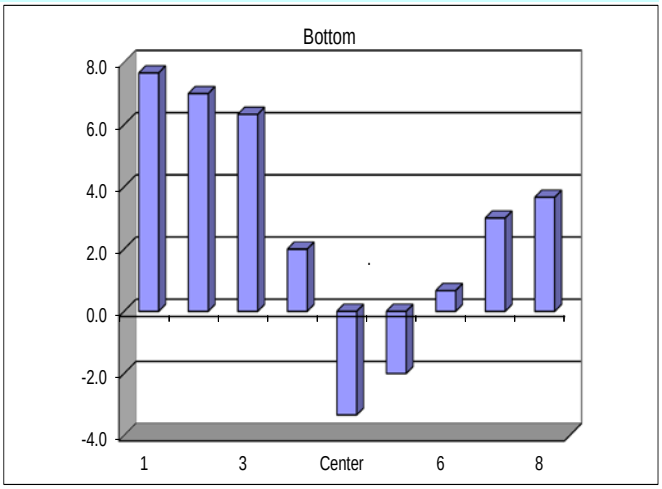
Instuments Used:			**Cal. Due**	
S-type pitot	Dwyer 24-inch S-type Pitot#10		Cert. of conformance	
Velocity sensor	TSI Velocicalc SN#T95351203001		15-Aug-15	
Angle indicator	Shop built		Cat. 3	
Manometer	Dwyer 400-5, S36N	MAN 5	Cat. 3	4/4/2015

Note:
To assure similar hose connections between the manometer and pitot tube, rotating the pitot tube assembly clockwise drives the meniscus to the right (to higher pos. numbers).

Notes:

CA
1/21/2015





Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	1/21/2015	Signature/date	3/2/2015
	Signature on file with Original		Signature on file in TI-WTPSP-135

C.3 LV-C2 Gas Tracer Calibration and Uniformity Data Sheets

GAS ANALYZER CALIBRATION

Site	LV-C2 Remedial Scale Model	Instrument	B&K Model 1302
Date	12/29/2014	Serial No.	1804888
Testers	EA, JAG	Property No.	WD54623

Setup:
- 6.3 ft B&K sample inlet tube length
- 1017 mbar station pressure
- 71 deg F ambient temp — analyzer corrects to 20 deg C
- 18 percent RH

Pre-Test background, ppb
Compensating for water vapor, monitoring task 2
945, 946, 940, 938, 863, 871, 819, 766, 848, 909

	1.99 ppm		59.9 ppm
Cylinder	SV17699	Cylinder	SV17805
start P =	1250 psi	start P =	1100 psi
end P =	1250 psi	end P =	1100 psi

B&K Calibration readings: (ppm)	B&K Calibration readings: (ppm)
2.14	61.2
2.12	61.9
2.11	62.0
2.14	61.8
2.12	62.0
2.12	61.7
2.09	61.9
2.11	61.8
2.10	61.7
2.10	61.7
2.07	61.6
2.11 = avg	**61.8** = avg
1.061 =avg/std	**1.031** =avg/std

Standards Used:	Do Not Use Per NCR OTS-02787	Expiration date:
Air Liquide 1.99 ppm N2O in air, SV17699		12/31/2014
Air Liquide 59.6 ppm N2O in air, SV17805		12/31/2014

Weather Station Used:

Fisher Scientific Traceable Hygro/Therm/Baro/Dew Point Pen, Mfg Control Co — 8/7/2015

Entries made by:	Ernest Antonio	Technical Data Review performed by:	Carmen Arimescu
Signature/date	*Signature on File with Original* 12/29/2014	Signature/date	5/1/2015
		Signature on file in TI-WTPSP-137	

GAS ANALYZER CALIBRATION

Site	LV-C2 Remedial Scale Model	Instrument	B&K Model 1302
Date	12/31/2014	Serial No.	1804888
Testers	EA, JAG	Property No.	WD54623

Setup:
- 6.5 ft B&K sample inlet tube length
- 1024 mbar station pressure
- 65 deg F ambient temp — analyzer corrects to 20 deg C
- 18.3 percent RH

Pre-Test background, ppm
Compensating for water vapor, monitoring task 2
0.4, 0.4, .5, .6, .5, .6, .6, .6, .5, .6

	1.99	ppm		59.9	ppm
Cylinder	SV17699		Cylinder	SV17805	
start P =	1100	psi	start P =	1050	psi
end P =	1100	psi	end P =	1030	psi

B&K Calibration readings: (ppm)	B&K Calibration readings: (ppm)
2.04	60.1
2.05	60.6
2.05	60.5
2.06	60.7
2.05	60.6
2.04	60.6
2.05	60.3
2.04	60.5
2.03	60.5
2.05	60.7
2.04	60.6
2.05 = avg	**60.5** = avg
1.028 =avg/std	**1.010** =avg/std

Standards Used:	Do Not Use Per NCR OTS-02787	Expiration date:
Air Liquide 1.99 ppm N2O in air, SV17699		12/31/2014
Air Liquide 59.6 ppm N2O in air, SV17805		12/31/2014

Weather Station Used:

Fisher Scientific Traceable Hygro/Therm/Baro/Dew Point Pen, Mfg Control Co — 8/7/2015

Entries made by:	Ernest Antonio	Technical Data Review performed by:	Carmen Arimescu
Signature/date	*Signature on file with original* 12/31/2014	Signature/date	5/1/2015
		Signature on file in TI-WTPSP-137	

GAS ANALYZER CALIBRATION

Site	LV-C2 Remedial Scale Model	Instrument	B&K Model 1302
Date	2/23/2015	Serial No.	1804888
Testers	CA,EA	Property No.	WD54623

Setup:	6.3	ft	B&K sample inlet tube length
	1019	mbar	station pressure
	66.2	deg F	ambient temp analyzer corrects to 20 deg C
	18.4	percent	RH

Pre-Test background, ppb
Compensating for water vapor, monitoring task 2
674, 624, 656, 627, 629, 639, 614, 617, 602, 622

	1.983	ppm		59.72	ppm
Cylinder	FF17099		Cylinder	FF17089	
start P =	1920	psi	start P =	1950	psi
end P =	1920	psi	end P =	1920	psi

B&K Calibration readings: (ppm)	B&K Calibration readings: (ppm)
2.10	60.5
2.11	60.8
2.12	60.8
2.09	60.7
2.06	60.7
2.11	60.5
2.10	60.5
2.09	60.6
2.07	60.4
2.08	60.3
2.09	60.3
2.09 = avg	**60.6** = avg
1.055 =avg/std	**1.014** =avg/std

Standards Used:			Expiration date:
Airgas 1.98 ppm, FF 17099			2/11/2016
Airgas 59.72 ppm, FF 17089			2/11/2016
Weather Station Used:			
Fisher Scientific Traceable Hygro/Therm/Baro/Dew Point Pen, Mfg Control Co			8/7/2015

Entries made by:	Carmen Arimescu 2/23/2015	Technical Data Review performed by:	
Signature/date	Signature on file with original	Signature/date	John Glissmeyer 5/26/2015
		Signature on file in TI-WTPSP-137	

GAS ANALYZER CALIBRATION

Site	LV-C2 Remedial Scale Model	Instrument	B&K Model 1302
Date	3/9/2015	Serial No.	1804888
Testers	CA, EA	Property No.	WD54623

Setup:
- 6.4 ft B&K sample inlet tube length
- 1003 mbar station pressure
- 18.4 deg C ambient temp analyzer corrects to 20 deg C
- 33.3 percent RH

Pre-Test background, ppb
Compensating for water vapor, monitoring task 2
691, 715, 734, 673, 727, 717, 733, 766, 837, 829

	1.983	ppm		59.72	ppm
Cylinder	FF17099		Cylinder	FF17089	
start P =	1950	psi	start P =	1900	psi
end P =	1930	psi	end P =	1900	psi

B&K Calibration readings: (ppm)		B&K Calibration readings: (ppm)	
2.09		59.8	
2.08		61.8	
2.09		61.8	
2.09		61.6	
2.08		61.4	
2.08		61.4	
2.08		61.4	
2.06		61.4	
2.07		61.3	
2.06		61.1	
2.06		61.1	
2.08	= avg	**61.3**	= avg
1.047	=avg/std	**1.026**	=avg/std

Standards Used:

			Expiration date:
Airgas 1.98 ppm, FF 17099			2/11/2016
Airgas 59.72 ppm, FF 17089			2/11/2016

Weather Station Used:

Fisher Scientific Traceable Hygro/Therm/Baro/Dew Point Pen, Mfg Control Co	8/7/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	
Signature/date	3/9/2015	Signature/date	John Glissmeyer 5/28/2015
	Signature on file with original		Signature on file in TI-WTPSP-137

GAS ANALYZER CALIBRATION

Site	LV-C2 Remedial Scale Model	Instrument	B&K Model 1302
Date	3/16/2015	Serial No.	1804888
Testers	CA, EA	Property No.	WD54623

Setup:
- 6.4 ft B&K sample inlet tube length
- 1009 mbar station pressure
- 19.3 deg C ambient temp — analyzer corrects to 20 deg C
- 32.1 percent RH

Pre-Test background, ppb
Compensating for water vapor, monitoring task 2
714, 730, 712, 703, 679, 607, 593, 609, 599, 594

	1.983 ppm		59.72 ppm
Cylinder	FF17099	Cylinder	FF17089
start P =	1910 psi	start P =	1900 psi
end P =	1910 psi	end P =	1900 psi

B&K Calibration readings: (ppm)	B&K Calibration readings: (ppm)
2.09	60.4
2.09	61.6
2.07	61.3
2.05	61.6
2.06	61.5
2.06	61.3
2.07	61.1
2.05,	61.2
2.05	61.2
2.06	61.2
2.04	61.3
2.06 = avg	**61.2** = avg
1.041 =avg/std	**1.026** =avg/std

Standards Used:			Expiration date:
Airgas 1.98 ppm, FF 17099			2/11/2016
Airgas 59.72 ppm, FF 17089			2/11/2016

Weather Station Used:

Fisher Scientific Traceable Hygro/Therm/Baro/Dew Point Pen, Mfg Control Co	8/7/2015
Entries made by: Carmen Arimescu Signature/date 3/16/2015 Signature on file with original	Technical Data Review performed by: Signature/date Xiao-Ying Yu 6/10/2015 Signature on file in TI-WTPSP-137

GAS ANALYZER CALIBRATION

Site	LV-C2 Remedial Scale Model	Instrument	B&K Model 1302
Date	3/17/2015	Serial No.	1804888
Testers	CA, EA	Property No.	WD54623

Setup:
- 6.4 ft B&K sample inlet tube length
- 1004 mbar station pressure
- 17.2 deg C ambient temp analyzer corrects to 20 deg C
- 50.1 percent RH

Pre-Test background, ppb
Compensating for water vapor, monitoring task 2
556, 542, 543, 524, 520, 527, 529, 518, 512, 504

	1.983 ppm		59.72 ppm
Cylinder	FF17099	Cylinder	FF17089
start P =	1900 psi	start P =	1850 psi
end P =	1900 psi	end P =	1800 psi

B&K Calibration readings: (ppm)		B&K Calibration readings: (ppm)	
2.01		59.3	
1.99		59.7	
2.00		59.7	
2.01		59.8	
1.98		59.7	
1.98		59.6	
1.97		59.7	
1.98		59.7	
2.01		59.7	
1.97		59.5	
2.00		59.6	
1.99	= avg	**59.6**	= avg
1.004	=avg/std	**0.999**	=avg/std

Standards Used:			Expiration date:
Airgas 1.98 ppm, FF 17099			2/11/2016
Airgas 59.72 ppm, FF 17089			2/11/2016
Weather Station Used:			
Fisher Scientific Traceable Hygro/Therm/Baro/Dew Point Pen, Mfg Control Co			8/7/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	
Signature/date	3/17/2015	Signature/date	Xiao-Ying Yu
	Signature on file with original		6/9/2015
			Signature on file in TI-WTPSP-137

GAS ANALYZER CALIBRATION

Site	LV-C2 Remedial Scale Model	Instrument	B&K Model 1302
Date	5/18/2015	Serial No.	1804888
Testers	CA, EA	Property No.	WD54623

Setup:
- 6.4 ft B&K sample inlet tube length
- 1003 mbar station pressure
- 20.2 deg C ambient temp analyzer corrects to 20 deg C
- 36.3 percent RH

Pre-Test background, ppb
Compensating for water vapor, monitoring task 2
660, 640, 643, 634, 611, 622, 587, 587, 603, 553

	1.983	ppm		59.72	ppm
Cylinder	FF17099		Cylinder	FF17089	
start P =	1900	psi	start P =	1800	psi
end P =	1900	psi	end P =	1800	psi

B&K Calibration readings: (ppm)	B&K Calibration readings: (ppm)
2.05	61.1
2.06	61.2
2.06	61.2
2.06	61.1
2.06	60.9
2.05	61.1
2.05	60.8
2,05	60.9
2.03	60.9
2.03	60.7
2.02	60.5
2.05 = avg	**60.9** = avg
1.032 =avg/std	**1.021** =avg/std

Standards Used:

			Expiration date:
Airgas 1.98 ppm, FF 17099			2/11/2016
Airgas 59.72 ppm, FF 17089			2/11/2016

Weather Station Used:

Fisher Scientific Traceable Hygro/Therm/Baro/Dew Point Pen, Mfg Control Co	8/7/2015

Entries made by: Carmen Arimescu	Technical Data Review performed by:
Signature/date 5/18/2015	Signature/date John Glissmeyer 5/26/2015
Signature on file with original	Signature on file in TI-WTPSP-137

GAS ANALYZER CALIBRATION

Site	LV-C2 Remedial Scale Model	Instrument	B&K Model 1302
Date	5/19/2015	Serial No.	1804888
Testers	CA, EA	Property No.	WD54623

Setup:

6.4	ft	B&K sample inlet tube length
1000	mbar	station pressure
23.9	deg C	ambient temp analyzer corrects to 20 deg C
38.5	percent	RH

Pre-Test background, ppb

Compensating for water vapor, monitoring task 2

510, 505, 488, 497, 488, 469, 466, 464, 484, 470

1.983	ppm			59.72	ppm
Cylinder	FF17099			Cylinder	FF17089
start P =	1900	psi		start P =	1800	psi
end P =	1900	psi		end P =	1750	psi

B&K Calibration readings: (ppm)		B&K Calibration readings: (ppm)	
1.92		58.6	
1.93		58.6	
1.93		58.6	
1.96		58.5	
1.94		58.2	
1.94		58.6	
1.96		58.6	
1.94		58.6	
1.93		58.6	
1.91		58.3	
1.94		58.5	
1.94	= avg	**58.5**	= avg
0.976	=avg/std	**0.980**	=avg/std

Standards Used:

			Expiration date:
Airgas 1.98 ppm, FF 17099			2/11/2016
Airgas 59.72 ppm, FF 17089			2/11/2016

Weather Station Used:

Fisher Scientific Traceable Hygro/Therm/Baro/Dew Point Pen, Mfg Control Co	8/7/2015

Entries made by: Carmen Arimescu	Technical Data Review performed by:
Signature/date 5/19/2015	Signature/date John Glissmeyer 5/26/2015
Signature on file with original	Signature on file in TI-WTPSP-137

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-1**
Date	12/30/2014	Fan Configuration	**B Max**
Testers	EA, YFS	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	57.1 deg F
Stack X-Area	111.6 in.2	Start/End Time	1000 / 1210
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I 3 Center**

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	24.5	24.4	24.2	24.4	23.6	22.5	22.9	23.0
2	1.25	24.0	24.1	23.8	24.0	23.8	23.2	23.1	23.4
3	2.31	24.0	23.9	24.3	24.1	23.7	23.3	23.3	23.4
4	3.85	24.3	24.1	24.1	24.2	23.9	23.8	23.5	23.7
Center	5.96	25.0	25.1	24.8	25.0	24.6	24.4	24.6	24.5
5	8.07	25.4	25.3	25.5	25.4	25.0	25.1	25.0	25.0
6	9.61	26.3	26.2	26.1	26.2	25.1	25.3	24.9	25.1
7	10.67	27.1	26.9	25.9	26.6	26.1	25.4	25.3	25.6
8	11.42	27.0	26.6	27.2	26.9	25.6	25.4	25.2	25.4
Averages ---------->		25.3	25.2	25.1	25.2	24.6	24.3	24.2	24.4

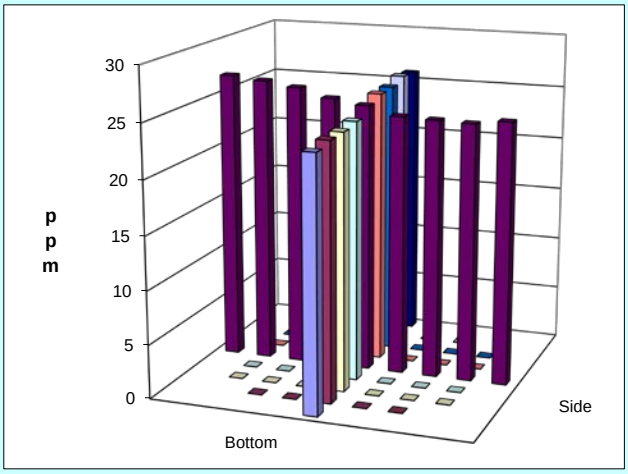
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	24.77		Mean	25.06	24.40	24.73
Min Point	23.00	-7.2%	Std. Dev.	1.07	0.89	1.01
Max Point	26.93	8.7%	COV as %	4.3	3.7	**4.1**

Avg. Conc. 24.775 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	390	390	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	55.8	58.4	°F
Mean stack velocity	3129	3253	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	30.5	30.48	inHg
Ambient humidity	16.2%	13.9%	RH
Ambient Temp	9.4	12.2	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.538, .594, .577	.7, .5, .4, .4, .4	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 12/29/2014

Notes: Ambient temp was measured inside tent with heaters on.
~~Do Not Use Per NCR OTS-02787~~

EA
12/30/2014

Entries made by:	Ernest Antonio	Technical Data Review performed by:	Carmen Arimescu
Signature/date	Signature on file with original 12/30/2014	Signature/date	5/1/2015 Signature on file in TI-WTPSP-137

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-2**
Date	12/30/2014	Fan Configuration	**B Max**
Testers	EA, JAG	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	56.8 deg F
Stack X-Area	111.6 in.2	Start/End Time	1415 / 1600
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I3 Far 1.5 in from far wall**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	23.3	23.6	23.6	23.5	23.7	23.6	23.3	23.5
2	1.25	23.8	23.5	23.4	23.6	24.0	23.7	23.3	23.7
3	2.31	23.7	23.6	23.7	23.7	24.2	23.8	23.6	23.9
4	3.85	23.9	23.8	23.9	23.9	24.4	24.1	23.9	24.1
Center	5.96	24.2	23.9	23.9	24.0	24.9	24.5	24.2	24.5
5	8.07	23.6	23.9	23.8	23.8	24.7	24.4	24.0	24.4
6	9.61	23.5	23.5	23.2	23.4	24.6	24.1	24.0	24.2
7	10.67	23.2	22.9	22.9	23.0	24.3	23.9	23.6	23.9
8	11.42	22.6	22.3	22.6	22.5	24.3	23.6	23.5	23.8
Averages ---------->		23.5	23.4	23.4	23.5	24.3	24.0	23.7	24.0

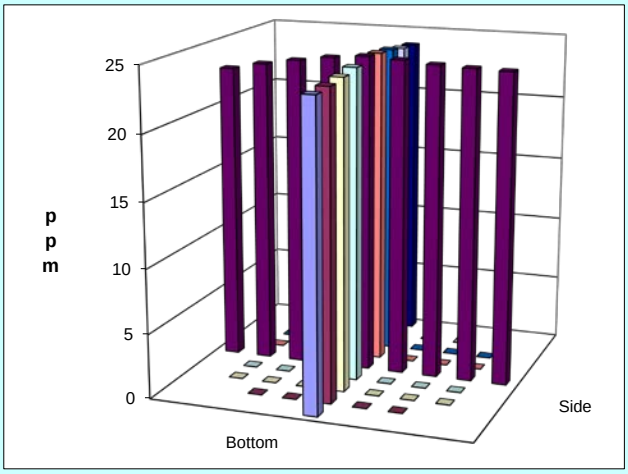
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	23.74		Mean	23.61	24.10	23.86
Min Point	22.50	-5.2%	Std. Dev.	0.33	0.30	0.40
Max Point	24.53	3.3%	COV as %	1.4	1.3	**1.7**

Avg. Conc. 23.675 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	450	450	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	56.8	56.8	°F
Mean stack velocity	3121	3089	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1031	1031	mbar
Ambient humidity	15%	15%	RH
Ambient Temp	12	12.7	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	0.5, .5, .5, .5, .5	.6, .4, .4, .4, .4	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 12/29/2014

Notes: Duct heaters ON. Tent heaters ON. Ambient Conditions taken inside tent.

JAG
12/30/2014

Do Not Use Per NCR OTS-02787

Entries made by:	Ernest Antonio	Technical Data Review performed by:	Carmen Arimescu
Signature/date	Signature on file with original 12/30/2014	Signature/date	5/1/2015 Signature on file in TI-WTPSP-137

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-3**
Date	12/31/2014	Fan Configuration	**B Max**
Testers	EA, YFS	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	48.35 deg F
Stack X-Area	111.6 in.2	Start/End Time	0915 / 1050
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I 3 1.5 inch from near wall**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	26.3	25.9	26.1	26.1	26.0	26.1	26.3	26.1
2	1.25	26.2	26.0	25.7	26.0	26.1	26.0	26.5	26.2
3	2.31	25.6	25.2	24.9	25.2	26.1	25.9	26.0	26.0
4	3.85	25.3	24.7	25.1	25.0	25.8	25.5	25.7	25.7
Center	5.96	24.8	24.5	24.7	24.7	24.8	25.0	25.0	24.9
5	8.07	24.2	24.3	24.1	24.2	24.3	24.4	24.2	24.3
6	9.61	24.2	24.3	24.3	24.3	24.2	23.7	23.9	23.9
7	10.67	24.5	24.1	24.0	24.2	24.2	24.1	23.6	24.0
8	11.42	25.3	23.9	24.1	24.4	23.9	24.0	23.8	23.9
Averages ---------->		25.2	24.8	24.8	24.9	25.0	25.0	25.0	25.0

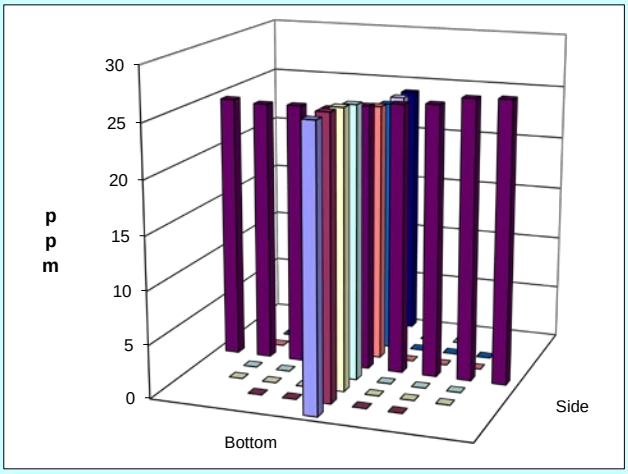
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	24.95		Mean	24.80	25.00	24.90
Min Point	23.90	-4.2%	Std. Dev.	0.66	0.96	0.80
Max Point	26.20	5.0%	COV as %	2.7	3.9	**3.2**

Avg. Conc. 24.971 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	300	310	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	42.6	54.1	°F
Mean stack velocity	3130	3160	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1029	1028.00	inHg
Ambient humidity	28.3%	21.8%	RH
Ambient Temp	4.6	11	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6, .6, .6, .6, .6	.7, .5, .5, .5, .5	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 12/29/2014

Notes: Temperature outside tent in the teens to low 20s.

Do Not Use Per NCR OTS-02787

EA
12/31/2014

Entries made by:	Ernest Antonio	Technical Data Review performed by:	Carmen Arimescu
Signature/date	Signature on file with original 12/31/2014	Signature/date	5/1/2015
			Signature on file in TI-WTPSP-137

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-4**
Date	12/31/2014	Fan Configuration	**B Max**
Testers	JAG, EA	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	57.75 deg F
Stack X-Area	111.6 in.2	Start/End Time	1405 / 1535
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I3 Top**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	24.3	24.1	23.8	24.1	26.0	25.5	25.2	25.6
2	1.25	24.5	24.1	24.0	24.2	25.8	25.2	25.4	25.5
3	2.31	24.3	23.9	23.8	24.0	25.8	25.2	25.1	25.4
4	3.85	24.2	24.0	24.0	24.1	25.4	25.0	24.9	25.1
Center	5.96	24.0	24.0	23.8	23.9	25.3	24.7	24.6	24.9
5	8.07	24.1	23.9	24.0	24.0	25.0	24.8	24.4	24.7
6	9.61	24.6	24.1	24.4	24.4	25.4	24.9	24.6	25.0
7	10.67	24.6	24.6	24.5	24.6	25.1	24.9	24.3	24.8
8	11.42	24.9	24.6	24.6	24.7	25.1	24.7	24.5	24.8
Averages ---------->		24.4	24.1	24.1	24.2	25.4	25.0	24.8	25.1

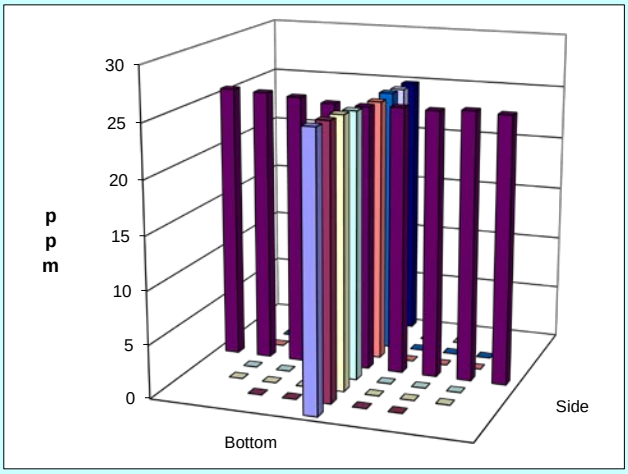
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	24.64		Mean	24.16	25.04	24.60
Min Point	23.93	-2.9%	Std. Dev.	0.23	0.29	0.52
Max Point	25.57	3.8%	COV as %	1.0	1.1	**2.1**

Avg. Conc. 24.669 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	400	400	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	58.8	56.7	°F
Mean stack velocity	3131	3100	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1025	1024	mbar
Ambient humidity	20%	15%	RH
Ambient Temp	12	17.3	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.5, .5, .5, .5, .5	.5, .4, .4, .4, .4	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 12/29/2014

Notes: Replaced injection probe with one with 2 7/8" hook.
Do Not Use Per NCR OTS-02787

JAG
12/31/2014

Entries made by:	J. Glissmeyer	Technical Data Review performed by:	Carmen Arimescu
Signature/date	12/31/2014	Signature/date	5/1/2015
	Signature on file with original		Signature on file in TI-WTPSP-137

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-5**
Date	2/23/2015	Fan Configuration	**Fan B Max**
Testers	CA,EA	Fan Setting	**58.7** **Hz**
Stack Dia.	11.922 in.	Stack Temp	51.25 deg F
Stack X-Area	111.6 in.2	Start/End Time	1100/1230
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I3 Bottom**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	25.2	24.9	24.7	24.9	25.0	24.8	24.8	24.9
2	1.25	25.0	25.0	24.8	24.9	25.1	24.8	24.7	24.9
3	2.31	25.2	25.1	24.9	25.1	25.4	25.2	24.9	25.2
4	3.85	25.5	25.3	25.4	25.4	25.4	25.4	25.2	25.3
Center	5.96	25.5	25.4	25.2	25.4	25.8	25.8	25.7	25.8
5	8.07	25.1	25.3	25.4	25.3	25.9	25.6	25.6	25.7
6	9.61	24.8	25.0	24.9	24.9	25.8	25.6	25.7	25.7
7	10.67	24.7	24.7	25.7	25.0	25.5	25.4	25.6	25.5
8	11.42	24.5	24.3	24.6	24.5	25.6	25.4	25.7	25.6
Averages ---------->		25.1	25.0	25.1	25.0	25.5	25.3	25.3	25.4

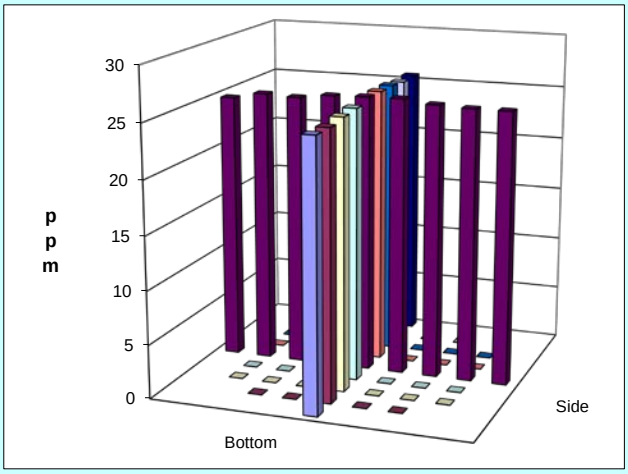
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	25.21		Mean	25.14	25.43	25.29
Min Point	24.47	-3.0%	Std. Dev.	0.20	0.33	0.31
Max Point	25.77	2.2%	COV as %	0.8	1.3	**1.2**

Avg. Conc. 25.169 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	450	450	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	50.3	52.2	°F
Mean stack velocity	3158	2973	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1018	1018	mbar
Ambient humidity	16.7%	14.8%	RH
Ambient Temp	21.0	19.7	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.7,.6,.6,.6,.6	.8,.6,.6,.5,.5	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 2/23/2015

Notes:

CA 2/23/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	John Glissmeyer
Signature/date	2/23/2015	Signature/date	6/1/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-6**
Date	2/24/2015	Fan Configuration	**Fan B Max**
Testers	CA,EA	Fan Setting	**58.7** **Hz**
Stack Dia.	11.922 in.	Stack Temp	44.6 deg F
Stack X-Area	111.6 in.2	Start/End Time	830/945
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I3 Center**

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	25.0	24.7	24.8	24.8	25.6	25.2	25.3	25.4
2	1.25	24.7	24.5	24.5	24.6	25.4	25.3	25.3	25.3
3	2.31	24.9	24.6	24.4	24.6	25.1	25.0	24.8	25.0
4	3.85	24.7	24.6	24.4	24.6	24.8	24.6	24.4	24.6
Center	5.96	24.7	24.5	24.5	24.6	24.2	24.3	24.0	24.2
5	8.07	24.9	24.8	24.7	24.8	24.4	24.2	23.8	24.1
6	9.61	25.4	25.2	25.1	25.2	24.6	24.4	24.4	24.5
7	10.67	25.6	25.5	25.3	25.5	24.6	24.2	24.3	24.4
8	11.42	25.6	25.7	25.6	25.6	24.1	24.0	24.1	24.1
Averages ---------->		25.1	24.9	24.8	24.9	24.8	24.6	24.5	24.6

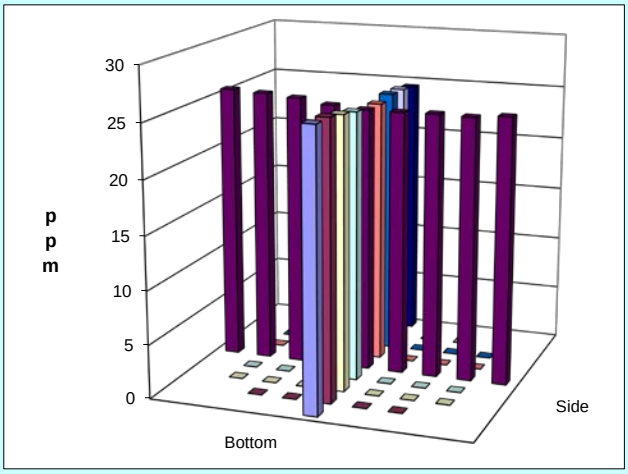
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	24.76		Mean	24.83	24.58	24.70
Min Point	24.07	-2.8%	Std. Dev.	0.37	0.44	0.41
Max Point	25.63	3.5%	COV as %	1.5	1.8	**1.7**

Avg. Conc. 24.815 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	490	500	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	42.2	47	°F
Mean stack velocity	3042	3063	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1012	1011	mbar
Ambient humidity	22.0%	23.9%	RH
Ambient Temp	17.9	15.4	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6,.6,.5,.5,.5	.8,.6,.6,.6,.6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 2/23/2015

Notes:

CA 2/24/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	2/24/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-7**
Date	2/25/2015	Fan Configuration	**Fan B Max**
Testers	CA,EA	Fan Setting	**58.7** **Hz**
Stack Dia.	11.922 in.	Stack Temp	48.3 deg F
Stack X-Area	111.6 in.2	Start/End Time	820/1000
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I3 Center**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	24.7	24.4	24.9	24.7	25.8	25.9	25.8	25.8
2	1.25	24.7	24.4	24.3	24.5	25.7	25.7	26.2	25.9
3	2.31	24.8	24.5	24.7	24.7	25.8	25.2	25.8	25.6
4	3.85	24.8	24.7	24.4	24.6	25.2	24.9	25.5	25.2
Center	5.96	24.5	24.3	24.5	24.4	24.8	24.5	24.6	24.6
5	8.07	24.9	24.7	24.7	24.8	24.8	24.8	24.7	24.8
6	9.61	25.4	25.1	25.2	25.2	25.0	24.9	24.7	24.9
7	10.67	25.4	25.5	25.6	25.5	25.0	25.0	24.7	24.9
8	11.42	25.7	25.8	26.2	25.9	25.1	24.9	25.0	25.0
Averages ---------->		25.0	24.8	24.9	24.9	25.2	25.1	25.2	25.2

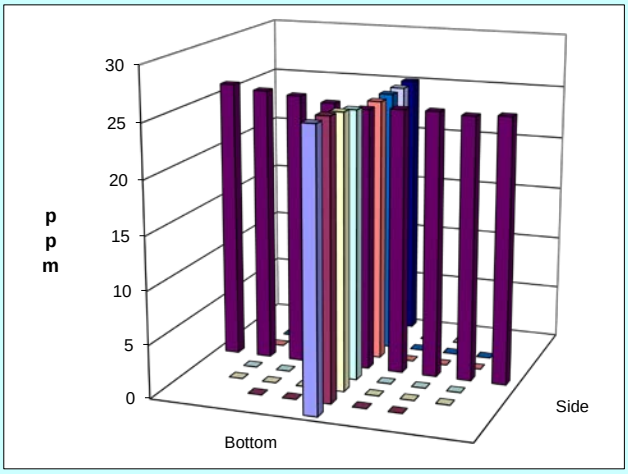
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	25.05		Mean	24.81	25.12	24.97
Min Point	24.43	-2.5%	Std. Dev.	0.40	0.46	0.44
Max Point	25.90	3.4%	COV as %	1.6	1.8	**1.8**

Avg. Conc. 25.117 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	495	600	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	43.5	53.1	°F
Mean stack velocity	3171	3047	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1014	1013	mbar
Ambient humidity	28.5%	22.6%	RH
Ambient Temp	16.0	21.5	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6,.6,.6,.6,.6	.7,.6,.6,.6,.5	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 2/25/2015

Notes:

CA 2/25/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	2/25/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-8**
Date	2/25/2015	Fan Configuration	**Fan B Norm**
Testers	CA,EA	Fan Setting	**50** **Hz**
Stack Dia.	11.922 in.	Stack Temp	56.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	1010/1120
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**I3 Center**

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	28.5	29.2	28.5	28.7	29.9	29.7	29.1	29.6
2	1.25	28.4	28.9	28.3	28.5	29.8	29.7	29.5	29.7
3	2.31	28.1	28.7	28.1	28.3	29.0	29.0	29.1	29.0
4	3.85	27.8	28.3	28.3	28.1	28.8	28.6	28.8	28.7
Center	5.96	28.2	27.8	28.2	28.1	28.3	27.9	28.5	28.2
5	8.07	28.7	28.4	28.4	28.5	28.4	28.1	28.3	28.3
6	9.61	29.1	29.2	29.2	29.2	28.1	28.3	28.7	28.4
7	10.67	29.1	29.7	29.5	29.4	28.6	28.8	28.1	28.5
8	11.42	29.7	30.0	29.7	29.8	27.9	27.8	28.3	28.0
Averages ---------->		28.6	28.9	28.7	28.7	28.8	28.7	28.7	28.7

All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	28.72		Mean	28.59	28.69	28.64
Min Point	28.00	-2.5%	Std. Dev.	0.52	0.52	0.50
Max Point	29.80	3.7%	COV as %	1.8	1.8	**1.7**

Avg. Conc. 28.796 ppm

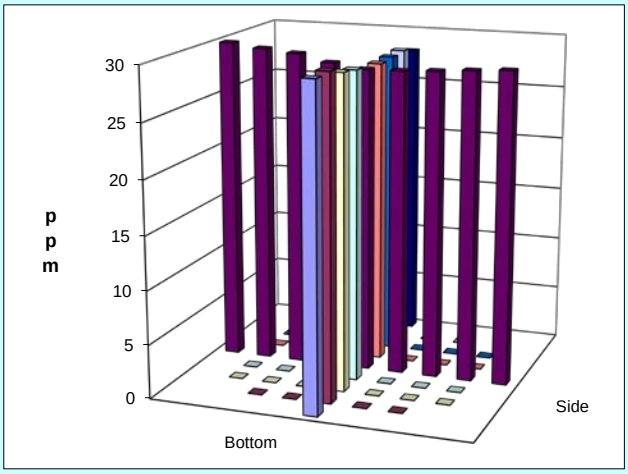
Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE

TSI Velocicalc SN#T95351203001 8/15/2015

Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	600	595	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	54.4	58.6	°F
Mean stack velocity	2601	2630	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1013	1012	mbar
Ambient humidity	22.2%	20.4%	RH
Ambient Temp	23.3	24.4	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.5,.5,.5,.5,.5	.6,.6,.5,.5,.6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 2/25/2015

Notes:

CA 2/25/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	2/25/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-9**
Date	3/2/2015	Fan Configuration	**Fan B Norm**
Testers	CA, EA	Fan Setting	**50** **Hz**
Stack Dia.	11.922 in.	Stack Temp	51.4 deg F
Stack X-Area	111.6 in.2	Start/End Time	920/1030
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Center I3**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	29.3	29.4	29.4	29.4	30.9	30.8	30.8	30.8
2	1.25	29.1	28.8	29.6	29.2	31.1	30.7	31.1	31.0
3	2.31	29.4	29.5	29.1	29.3	30.2	30.2	30.2	30.2
4	3.85	28.8	28.9	29.3	29.0	30.0	29.6	29.5	29.7
Center	5.96	28.5	28.8	29.2	28.8	28.6	29.0	29.2	28.9
5	8.07	29.2	28.7	28.7	28.9	28.6	29.0	29.0	28.9
6	9.61	29.5	29.8	29.0	29.4	29.2	29.2	28.8	29.1
7	10.67	29.6	30.2	30.4	30.1	29.5	29.0	29.2	29.2
8	11.42	30.1	30.1	30.7	30.3	29.0	29.0	29.0	29.0
Averages ---------->		29.3	29.4	29.5	29.4	29.7	29.6	29.6	29.6

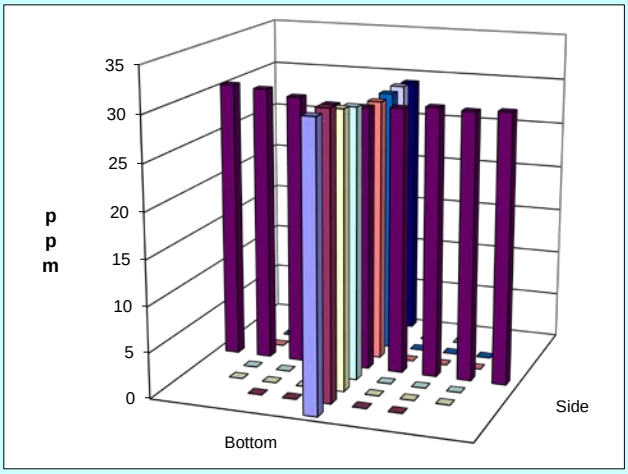
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	29.51		Mean	29.24	29.57	29.40
Min Point	28.83	-2.3%	Std. Dev.	0.43	0.78	0.63
Max Point	30.97	4.9%	COV as %	1.5	2.6	**2.1**

Avg. Conc. 29.588 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	490	490	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	46.6	56.2	°F
Mean stack velocity	2624	2678	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1000	1000	mbar
Ambient humidity	20.8%	22.5%	RH
Ambient Temp	18.5	18.8	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.7,.7,.7,.6,.6	.6,.6,.7,.7,.6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/2/2015

Notes:

CA 3/2/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/2/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-10**
Date	3/2/2015	Fan Configuration	**Fan B Min**
Testers	CA, EA	Fan Setting	**32** **Hz**
Stack Dia.	11.922 in.	Stack Temp	55.75 deg F
Stack X-Area	111.6 in.2	Start/End Time	1036/1146
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Center I3**

		1st				2nd			
Order -->									
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	45.6	45.8	45.6	45.7	47.9	47.4	47.6	47.6
2	1.25	45.6	46.1	46.3	46.0	46.9	48.4	47.7	47.7
3	2.31	44.4	45.2	45.2	44.9	47.7	47.7	46.4	47.3
4	3.85	45.0	44.8	45.2	45.0	46.8	45.7	45.9	46.1
Center	5.96	44.6	44.6	45.0	44.7	43.9	44.8	44.0	44.2
5	8.07	44.8	45.1	44.8	44.9	43.7	44.4	44.3	44.1
6	9.61	45.8	45.4	46.0	45.7	44.1	43.8	44.0	44.0
7	10.67	46.1	46.5	45.5	46.0	44.1	44.4	44.1	44.2
8	11.42	46.1	47.5	46.9	46.8	43.3	44.6	44.2	44.0
Averages ---------->		45.3	45.7	45.6	45.5	45.4	45.7	45.4	45.5

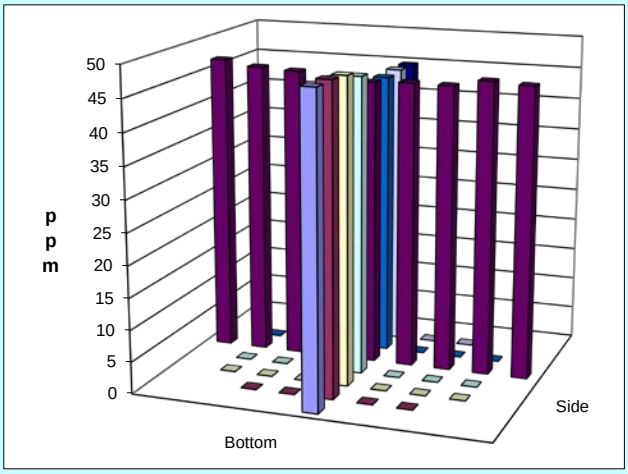
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	45.51		Mean	45.33	45.37	45.35
Min Point	43.97	-3.4%	Std. Dev.	0.56	1.61	1.16
Max Point	47.67	4.7%	COV as %	1.2	3.6	**2.6**

Avg. Conc. 45.633 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	500	500	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	56.8	54.7	°F
Mean stack velocity	1602	1614	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	999.8	999.8	mbar
Ambient humidity	17.3%	21.1%	RH
Ambient Temp	22.4	20.0	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.5,.5,.5,.5,.5	.7,.6,.6,.6,.6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/2/2015

Notes:

CA 3/2/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/2/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-11**
Date	3/3/2015	Fan Configuration	**Fan B Min**
Testers	CA,EA	Fan Setting	**32** **Hz**
Stack Dia.	11.922 in.	Stack Temp	46.45 deg F
Stack X-Area	111.6 in.2	Start/End Time	830/947
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Center I3**

		2nd				1st			
Order -->									
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	44.5	47.3	45.3	45.7	49.1	48.7	48.4	48.7
2	1.25	44.5	44.7	45.0	44.7	49.3	47.7	47.0	48.0
3	2.31	44.7	44.1	43.7	44.2	48.3	48.6	46.8	47.9
4	3.85	43.5	43.3	43.6	43.5	46.9	46.4	46.1	46.5
Center	5.96	43.3	43.5	43.6	43.5	46.4	45.3	44.6	45.4
5	8.07	44.8	44.4	44.0	44.4	44.7	43.8	43.6	44.0
6	9.61	44.7	45.2	44.4	44.8	46.0	44.9	44.9	45.3
7	10.67	45.0	46.2	44.3	45.2	44.9	44.6	43.3	44.3
8	11.42	45.9	45.8	46.3	46.0	43.6	43.4	42.9	43.3
Averages ---------->		44.5	44.9	44.5	44.7	46.6	45.9	45.3	45.9

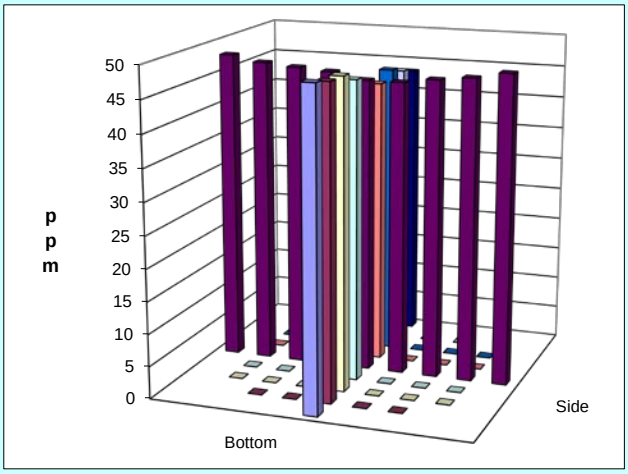
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	45.29		Mean	44.31	45.91	45.11
Min Point	43.30	-4.4%	Std. Dev.	0.65	1.61	1.44
Max Point	48.73	7.6%	COV as %	1.5	3.5	**3.2**

Avg. Conc. 45.398 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	400	450	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	44.1	48.8	°F
Mean stack velocity	1642	1606	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1011	1011	mbar
Ambient humidity	20.7%	14.4%	RH
Ambient Temp	17.9	20.8	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.7,.7,.7,.7,.6	.7,.6,.6,.6,.6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/2/2015

Notes:

CA 3/3/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/3/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-12**
Date	3/3/2015	Fan Configuration	**Fan A Min**
Testers	CA,EA	Fan Setting	**27** **Hz**
Stack Dia.	11.922 in.	Stack Temp	49.25 deg F
Stack X-Area	111.6 in.2	Start/End Time	1017/1107
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Center I4**

		1st				2nd			
Order -->									
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	45.8	45.4	45.9	45.7	45.2	45.4	45.2	45.3
2	1.25	45.2	45.1	45.5	45.3	46.0	45.3	45.3	45.5
3	2.31	45.7	45.4	45.6	45.6	45.5	45.7	45.6	45.6
4	3.85	45.3	44.8	46.0	45.4	45.7	45.6	45.8	45.7
Center	5.96	45.2	45.7	46.0	45.6	45.2	45.4	45.5	45.4
5	8.07	45.2	45.0	45.6	45.3	45.6	45.2	45.8	45.5
6	9.61	45.3	45.5	45.7	45.5	45.3	45.6	45.5	45.5
7	10.67	44.9	45.8	45.7	45.5	45.4	45.5	45.5	45.5
8	11.42	45.2	45.8	45.5	45.5	45.9	45.9	45.4	45.7
Averages ---------->		45.3	45.4	45.7	45.5	45.5	45.5	45.5	45.5

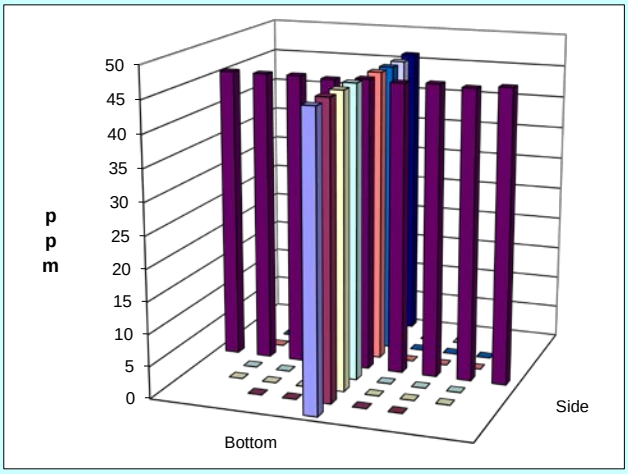
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	45.50		Mean	45.44	45.52	45.48
Min Point	45.27	-0.5%	Std. Dev.	0.14	0.11	0.13
Max Point	45.73	0.5%	COV as %	0.3	0.2	**0.3**

Avg. Conc. 45.496 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	500	500	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	48.9	49.6	°F
Mean stack velocity	1627	1604	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1011	1010	mbar
Ambient humidity	14.4%	15.4%	RH
Ambient Temp	20.8	18.4	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6,.5,.5,.5,.5	.6,.6,.6,.6,.6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/2/2015

Notes:

CA 3/3/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/3/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-13**
Date	3/4/2015	Fan Configuration	**Fan A Min**
Testers	CA,EA	Fan Setting	**27** **Hz**
Stack Dia.	11.922 in.	Stack Temp	41.55 deg F
Stack X-Area	111.6 in.2	Start/End Time	830/952
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Top I4**

		2nd				1st			
Order -->									
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	46.7	46.3	46.0	46.3	48.0	47.5	46.8	47.4
2	1.25	47.2	46.5	46.3	46.7	48.0	48.2	46.8	47.7
3	2.31	47.0	46.1	45.8	46.3	47.8	47.6	47.4	47.6
4	3.85	46.5	46.5	46.4	46.5	48.1	47.3	47.4	47.6
Center	5.96	47.1	46.4	46.1	46.5	47.8	47.4	47.5	47.6
5	8.07	47.1	46.4	46.3	46.6	48.3	47.3	47.0	47.5
6	9.61	46.8	46.4	46.6	46.6	48.1	47.5	47.3	47.6
7	10.67	46.7	46.5	46.7	46.6	47.7	47.3	47.8	47.6
8	11.42	46.6	46.3	46.4	46.4	47.6	47.7	47.3	47.5
Averages ---------->		46.9	46.4	46.3	46.5	47.9	47.5	47.3	47.6

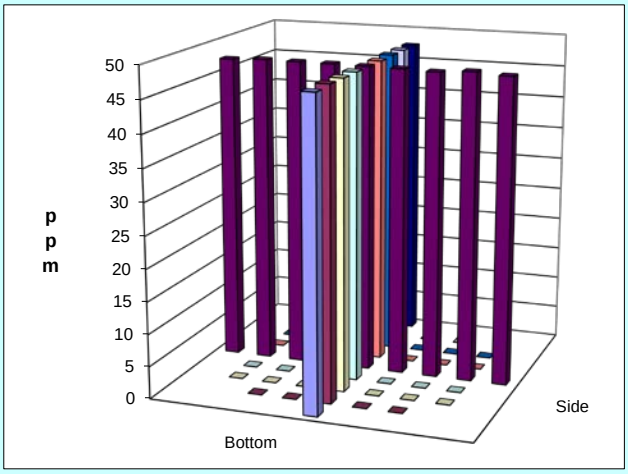
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	47.04		Mean	46.54	47.60	47.07
Min Point	46.30	-1.6%	Std. Dev.	0.13	0.04	0.56
Max Point	47.67	1.3%	COV as %	0.3	0.1	**1.2**

Avg. Conc. 47.040 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	400	490	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	37.8	45.3	°F
Mean stack velocity	1663	1601	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1013	1013	mbar
Ambient humidity	17.7%	11.6%	RH
Ambient Temp	18.2	24.0	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.8,.7,.7,.7,.6	.6,.6,.6,.6,.6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/2/2015

Notes:

CA 3/4/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/4/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-14**
Date	3/4/2015	Fan Configuration	**Fan A Min**
Testers	CA,EA	Fan Setting	**27** **Hz**
Stack Dia.	11.922 in.	Stack Temp	49.85 deg F
Stack X-Area	111.6 in.2	Start/End Time	1000/1115
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Bottom I4**

		1st				2nd			
Order -->									
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	46.6	47.2	46.6	46.8	45.8	45.9	45.9	45.9
2	1.25	47.6	46.7	46.2	46.8	45.8	46.5	45.6	46.0
3	2.31	47.0	46.4	45.7	46.4	45.7	46.3	46.6	46.2
4	3.85	46.9	46.4	46.0	46.4	46.2	45.9	46.0	46.0
Center	5.96	46.7	46.2	46.0	46.3	46.3	45.9	46.2	46.1
5	8.07	46.4	46.1	46.2	46.2	45.6	45.9	46.1	45.9
6	9.61	46.7	46.3	45.9	46.3	46.1	46.1	46.1	46.1
7	10.67	46.6	46.1	45.9	46.2	45.4	45.8	45.9	45.7
8	11.42	46.6	45.8	46.1	46.2	45.8	46.4	45.3	45.8
Averages ---------->		46.8	46.4	46.1	46.4	45.9	46.1	46.0	46.0

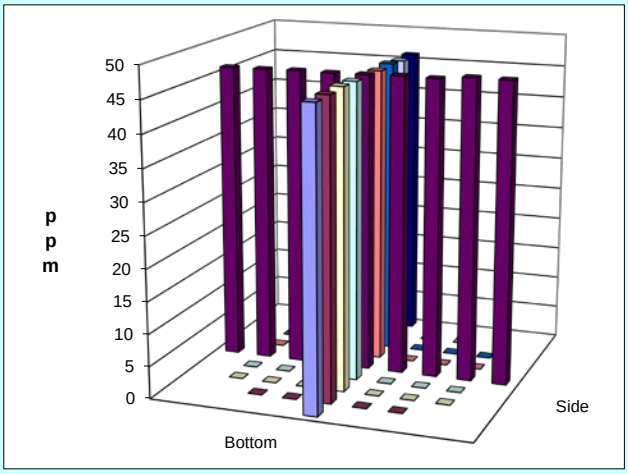
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	46.19		Mean	46.38	46.00	46.19
Min Point	45.70	-1.1%	Std. Dev.	0.21	0.17	0.27
Max Point	46.83	1.4%	COV as %	0.5	0.4	**0.6**

Avg. Conc. 46.181 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	500	500	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	46.9	52.8	°F
Mean stack velocity	1611	1610	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1013	1012	mbar
Ambient humidity	11.6%	10.0%	RH
Ambient Temp	24.0	26.0	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6,.6,.6,.6,.6	.8,.6,.6,.6,.6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/2/2015

Notes:

CA 3/4/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/4/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-15**
Date	3/5/2015	Fan Configuration	**Fan A Min**
Testers	CA,EA	Fan Setting	**27** **Hz**
Stack Dia.	11.922 in.	Stack Temp	41.65 deg F
Stack X-Area	111.6 in.2	Start/End Time	815/935
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Far Wall I4**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	24.9	24.2	25.2	24.8	26.6	26.1	25.2	26.0
2	1.25	24.3	24.7	24.6	24.5	25.7	25.1	24.9	25.2
3	2.31	24.8	24.8	24.4	24.7	25.1	25.0	25.0	25.0
4	3.85	24.5	24.9	23.9	24.4	25.2	24.8	24.7	24.9
Center	5.96	24.3	24.2	23.7	24.1	24.9	24.1	24.3	24.4
5	8.07	24.0	23.3	23.6	23.6	24.9	24.4	24.1	24.5
6	9.61	23.2	23.5	23.6	23.4	23.9	23.9	23.6	23.8
7	10.67	23.1	23.6	22.7	23.1	23.9	23.7	23.9	23.8
8	11.42	23.5	23.9	22.3	23.2	24.1	24.1	23.5	23.9
Averages ---------->		24.1	24.1	23.8	24.0	24.9	24.6	24.4	24.6

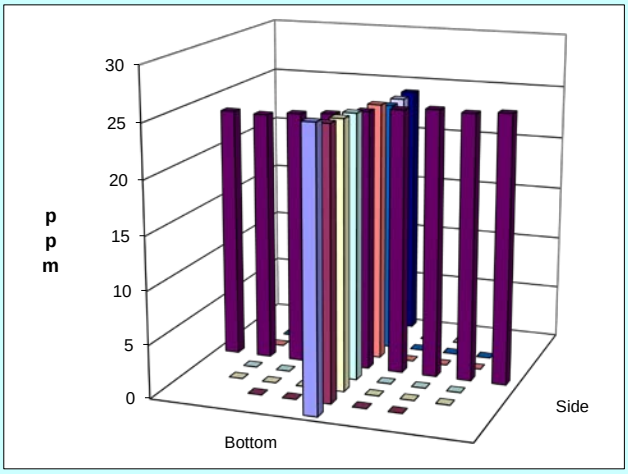
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	24.30		Mean	23.99	24.53	24.26
Min Point	23.13	-4.8%	Std. Dev.	0.60	0.57	0.62
Max Point	25.97	6.8%	COV as %	2.5	2.3	**2.6**

Avg. Conc. 24.310 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	420	500	psig
Injection flowmeter	0.8	0.8	slpm
Stack Temp	38.7	44.6	°F
Mean stack velocity	1600	1623	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1013	1013	mbar
Ambient humidity	21.4%	17.3%	RH
Ambient Temp	15.8	21.7	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.7,.7,.7,.7,.7	.7,.6,.6,.6,.5	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/2/2015

Notes:

CA 3/5/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/5/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-16**
Date	3/5/2015	Fan Configuration	**Fan A Min**
Testers	CA,EA	Fan Setting	**27** **Hz**
Stack Dia.	11.922 in.	Stack Temp	61.2 deg F
Stack X-Area	111.6 in.2	Start/End Time	1310/1419
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Near Wall I4**

		1st				2nd			
Order -->									
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	25.5	25.3	24.9	25.2	24.3	24.2	24.9	24.5
2	1.25	25.7	25.4	24.9	25.3	24.3	24.5	24.5	24.4
3	2.31	25.4	25.3	25.1	25.3	24.7	25.1	24.4	24.7
4	3.85	25.4	25.3	25.1	25.3	24.5	25.1	24.6	24.7
Center	5.96	25.8	25.6	25.1	25.5	25.0	25.1	24.9	25.0
5	8.07	25.5	25.1	25.3	25.3	25.1	25.0	24.9	25.0
6	9.61	26.0	26.0	25.1	25.7	25.0	25.1	25.0	25.0
7	10.67	25.6	25.7	25.4	25.6	25.6	25.3	25.6	25.5
8	11.42	26.1	25.3	25.8	25.7	25.3	25.3	24.9	25.2
Averages ---------->		25.7	25.4	25.2	25.4	24.9	25.0	24.9	24.9

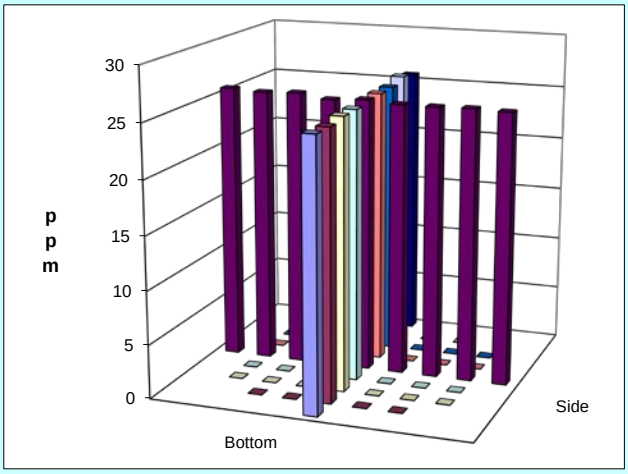
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	25.16		Mean	25.42	24.92	25.17
Min Point	24.43	-2.9%	Std. Dev.	0.17	0.33	0.36
Max Point	25.73	2.3%	COV as %	0.7	1.3	**1.4**

Avg. Conc. 25.154 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	500	510	psig
Injection flowmeter	0.8	0.8	slpm
Stack Temp	61.7	60.7	°F
Mean stack velocity	1632	1694	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1012	1012	mbar
Ambient humidity	18.5%	21.3%	RH
Ambient Temp	18.7	17.5	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6,.7,.6,.6,.6	.9,.6,.6,.6,.5	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/2/2015

Notes:

CA 3/5/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/5/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-17**
Date	3/6/2015	Fan Configuration	**Fan A Min**
Testers	CA,EA	Fan Setting	**27** **Hz**
Stack Dia.	11.922 in.	Stack Temp	48.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	830/955
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Far Wall I4**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	24.6	24.6	24.3	24.5	25.6	25.6	24.6	25.3
2	1.25	24.6	24.6	23.8	24.3	25.7	26.0	25.2	25.6
3	2.31	24.9	24.7	24.2	24.6	25.5	25.4	25.1	25.3
4	3.85	25.0	24.2	24.3	24.5	25.5	25.0	24.5	25.0
Center	5.96	24.5	24.3	24.1	24.3	25.4	24.6	24.8	24.9
5	8.07	24.0	23.9	23.7	23.9	24.9	24.6	24.3	24.6
6	9.61	24.2	24.0	24.1	24.1	24.7	24.6	24.6	24.6
7	10.67	24.1	23.8	24.1	24.0	24.3	24.3	24.2	24.3
8	11.42	24.2	23.4	23.8	23.8	24.2	24.4	24.0	24.2
Averages ---------->		24.5	24.2	24.0	24.2	25.1	24.9	24.6	24.9

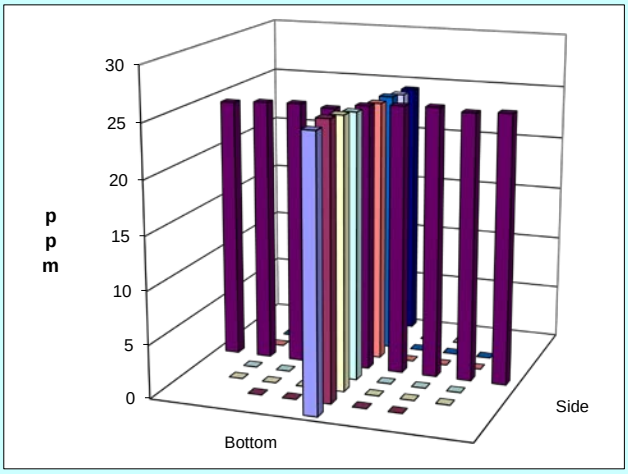
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	24.55		Mean	24.24	24.91	24.58
Min Point	23.80	-3.0%	Std. Dev.	0.27	0.47	0.50
Max Point	25.63	4.4%	COV as %	1.1	1.9	**2.1**

Avg. Conc. 24.540 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	500	510	psig
Injection flowmeter	0.8	0.8	slpm
Stack Temp	45.5	51.5	°F
Mean stack velocity	1610	1594	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1015	1015	mbar
Ambient humidity	21.6%	22.4%	RH
Ambient Temp	21.0	22.3	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.7,.7,.7,.7,.6	.6,.6,.6,.6,.6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/2/2015

Notes:

CA 3/6/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/6/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-18**
Date	3/6/2015	Fan Configuration	**Fan A Min**
Testers	CA,EA	Fan Setting	**27** **Hz**
Stack Dia.	11.922 in.	Stack Temp	53.75 deg F
Stack X-Area	111.6 in.2	Start/End Time	1000/1110
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Far Wall I4**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	23.8	24.2	24.5	24.2	24.4	24.7	24.3	24.5
2	1.25	24.4	24.2	24.3	24.3	24.3	25.0	24.7	24.7
3	2.31	24.4	24.4	24.6	24.5	24.5	24.7	24.9	24.7
4	3.85	24.3	23.7	23.8	23.9	24.5	24.4	24.0	24.3
Center	5.96	23.9	24.0	24.2	24.0	23.8	24.3	24.2	24.1
5	8.07	24.0	23.7	23.8	23.8	23.8	24.0	23.8	23.9
6	9.61	23.4	24.2	23.7	23.8	23.6	23.8	23.6	23.7
7	10.67	23.7	24.0	23.2	23.6	23.7	23.7	23.5	23.6
8	11.42	23.4	24.0	24.0	23.8	23.0	23.8	23.7	23.5
Averages ---------->		23.9	24.0	24.0	24.0	24.0	24.3	24.1	24.1

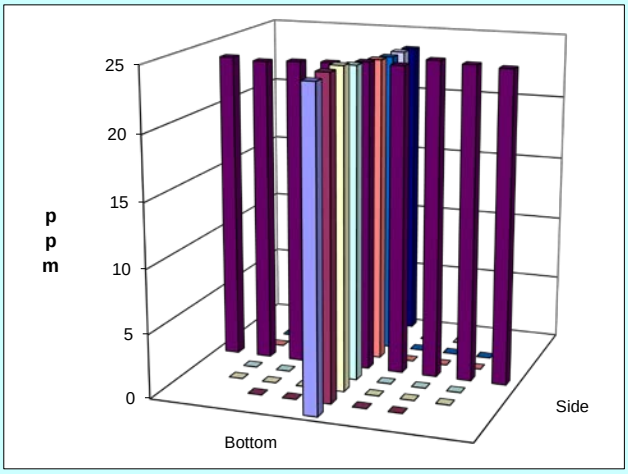
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	24.05		Mean	24.00	24.13	24.06
Min Point	23.50	-2.3%	Std. Dev.	0.30	0.44	0.37
Max Point	24.70	2.7%	COV as %	1.2	1.8	**1.5**

Avg. Conc. 24.044 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	510	590	psig
Injection flowmeter	0.8	0.8	slpm
Stack Temp	51.5	56	°F
Mean stack velocity	1594	1598	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1015	1014	mbar
Ambient humidity	22.4%	21.3%	RH
Ambient Temp	22.3	22.5	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6,.6,.6,.6,.6	.7,.6,.5,.5,.6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/2/2015

Notes: Start for GT-18 is the end of GT17.

CA 3/6/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/6/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-19**
Date	3/9/2015	Fan Configuration	**Fan A Norm**
Testers	CA,EA	Fan Setting	**42** **Hz**
Stack Dia.	11.922 in.	Stack Temp	58.95 deg F
Stack X-Area	111.6 in.2	Start/End Time	940/1050
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Far Wall I4**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	16.2	16.2	16.1	16.2	16.3	16.6	16.2	16.4
2	1.25	16.1	15.8	15.8	15.9	16.5	16.4	16.4	16.4
3	2.31	16.1	16.1	16.2	16.1	16.1	16.4	16.3	16.3
4	3.85	16.0	15.8	15.9	15.9	16.2	16.2	16.0	16.1
Center	5.96	15.9	15.7	16.1	15.9	16.1	15.9	16.0	16.0
5	8.07	15.8	15.8	15.6	15.7	15.8	15.9	15.7	15.8
6	9.61	15.7	15.5	15.7	15.6	15.7	15.5	15.6	15.6
7	10.67	15.5	15.2	15.6	15.4	15.5	15.4	15.4	15.4
8	11.42	15.4	15.5	15.5	15.5	15.7	15.8	15.4	15.6
Averages ---------->		15.9	15.7	15.8	15.8	16.0	16.0	15.9	16.0

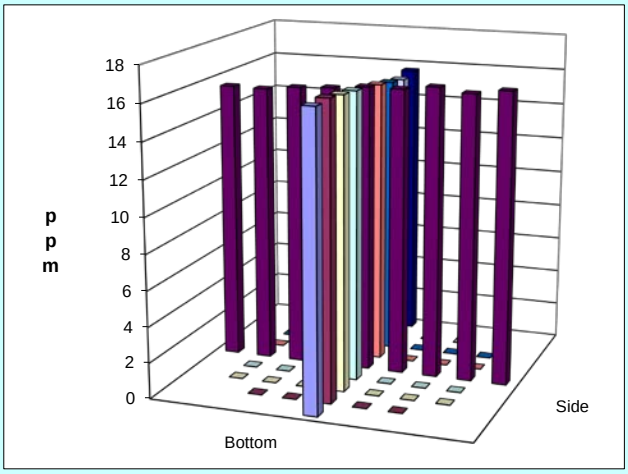
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	15.89		Mean	15.80	15.95	15.88
Min Point	15.43	-2.8%	Std. Dev.	0.23	0.36	0.30
Max Point	16.43	3.5%	COV as %	1.4	2.3	**1.9**

Avg. Conc. 15.877 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	500	575	psig
Injection flowmeter	0.8	0.8	slpm
Stack Temp	55.4	62.5	°F
Mean stack velocity	2637	2597	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1003	1003	mbar
Ambient humidity	25.5%	31.7%	RH
Ambient Temp	21.4	19.0	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6,.6,.6,.6,.6	.7,.6,.6,.5,.5	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/9/2015

Notes:

CA 3/9/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/9/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-20**
Date	3/9/2015	Fan Configuration	**Fan A Norm**
Testers	CA,EA	Fan Setting	**42** **Hz**
Stack Dia.	11.922 in.	Stack Temp	65.9 deg F
Stack X-Area	111.6 in.2	Start/End Time	1052/1147
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Far Wall I4**

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	16.1	16.2	16.6	16.3	16.4	16.3	16.9	16.5
2	1.25	16.4	15.8	16.5	16.2	16.6	16.0	16.4	16.3
3	2.31	16.3	15.9	16.3	16.2	16.1	16.4	16.3	16.3
4	3.85	15.9	16.2	16.2	16.1	16.3	16.1	16.4	16.3
Center	5.96	15.9	15.9	16.1	16.0	15.8	16.0	16.0	15.9
5	8.07	15.5	15.6	15.8	15.6	15.8	16.0	15.9	15.9
6	9.61	15.4	15.4	15.6	15.5	15.8	15.9	15.3	15.7
7	10.67	15.7	15.5	15.6	15.6	15.3	15.7	15.7	15.6
8	11.42	15.5	15.1	15.6	15.4	15.3	15.7	15.6	15.5
Averages ---------->		15.9	15.7	16.0	15.9	15.9	16.0	16.1	16.0

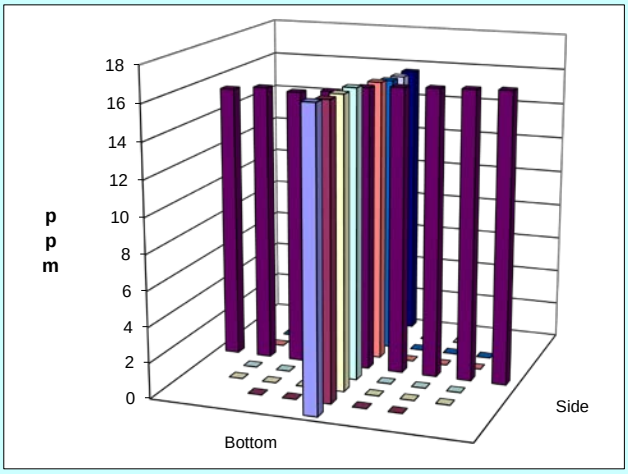
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	15.94		Mean	15.88	15.99	15.94
Min Point	15.40	-3.4%	Std. Dev.	0.31	0.31	0.30
Max Point	16.53	3.7%	COV as %	1.9	1.9	**1.9**

Avg. Conc. 15.935 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	575	550	psig
Injection flowmeter	0.8	0.8	slpm
Stack Temp	62.5	69.3	°F
Mean stack velocity	2597	2707	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1003	1002	mbar
Ambient humidity	31.7%	29.0%	RH
Ambient Temp	19.0	20.1	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.7,.6,.6,.5,.5	.7,.5,.5,.5,.5	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/9/2015

Notes: Start data for GT-20 is the finish data for GT-19

CA 3/9/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/9/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-21**
Date	3/10/2015	Fan Configuration	**Fan A Max**
Testers	CA,EA	Fan Setting	**50 Hz**
Stack Dia.	11.922 in.	Stack Temp	68.6 deg F
Stack X-Area	111.6 in.2	Start/End Time	1200/121
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Far Wall I4**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	28.5	28.3	28.8	28.5	29.0	28.9	28.8	28.9
2	1.25	28.8	27.6	28.4	28.3	29.4	28.6	28.5	28.8
3	2.31	28.2	28.3	28.2	28.2	29.2	28.3	28.4	28.6
4	3.85	27.6	28.1	27.7	27.8	28.8	28.4	28.3	28.5
Center	5.96	27.7	27.7	27.8	27.7	28.3	28.2	27.6	28.0
5	8.07	27.3	27.0	27.5	27.3	28.0	27.5	27.7	27.7
6	9.61	27.0	27.0	27.6	27.2	27.7	27.2	27.9	27.6
7	10.67	26.4	26.4	26.5	26.4	27.2	27.3	27.4	27.3
8	11.42	27.6	26.2	26.2	26.7	27.2	27.3	27.0	27.2
Averages ---------->		27.7	27.4	27.6	27.6	28.3	28.0	28.0	28.1

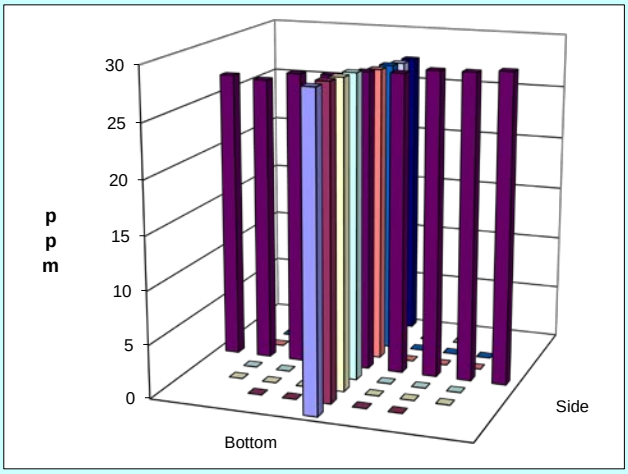
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	27.82		Mean	27.56	28.09	27.83
Min Point	26.43	-5.0%	Std. Dev.	0.65	0.58	0.65
Max Point	28.90	3.9%	COV as %	2.4	2.1	**2.3**

Avg. Conc. 27.817 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	500	500	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	66.5	70.7	°F
Mean stack velocity	3246	3109	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	998.9	997.8	mbar
Ambient humidity	27.7%	26.5%	RH
Ambient Temp	18.7	20.8	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6,.6,.6,.6,.6	.6,.6,.6,.5,.6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/9/2015

Notes:

CA 3/10/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/10/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-22**
Date	3/10/2015	Fan Configuration	**Fan A Max**
Testers	CA,EA	Fan Setting	**50 Hz**
Stack Dia.	11.922 in.	Stack Temp	72.2 deg F
Stack X-Area	111.6 in.2	Start/End Time	122/230
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Far Wall I4**

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	27.9	28.3	28.1	28.1	27.6	28.1	27.7	27.8
2	1.25	27.3	27.6	28.4	27.8	27.5	27.8	27.9	27.7
3	2.31	27.7	27.8	28.0	27.8	28.0	27.1	27.5	27.5
4	3.85	27.6	27.7	27.5	27.6	27.8	27.5	27.6	27.6
Center	5.96	27.3	27.4	27.2	27.3	27.2	27.2	27.1	27.2
5	8.07	26.8	26.9	26.3	26.7	26.7	27.0	27.0	26.9
6	9.61	26.0	26.4	26.8	26.4	26.5	26.7	26.4	26.5
7	10.67	26.8	25.7	26.4	26.3	26.8	26.1	26.5	26.5
8	11.42	26.6	25.9	25.9	26.1	26.2	26.6	26.3	26.4
Averages ---------->		27.1	27.1	27.2	27.1	27.1	27.1	27.1	27.1

All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	27.12		Mean	27.12	27.14	27.13
Min Point	26.13	-3.7%	Std. Dev.	0.66	0.52	0.57
Max Point	28.10	3.6%	COV as %	2.4	1.9	**2.1**

Avg. Conc. 27.110 ppm

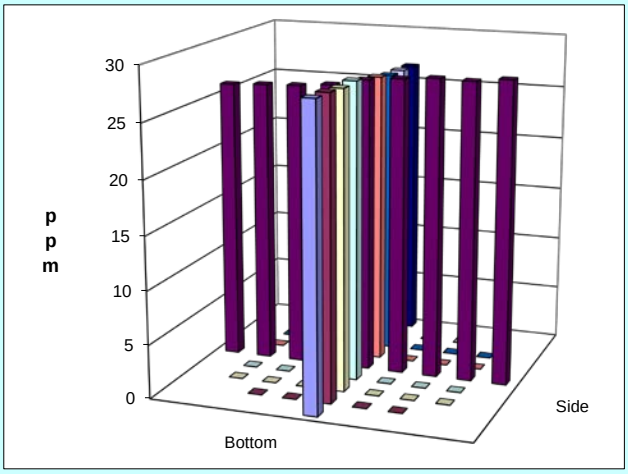
Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE

TSI Velocicalc SN#T95351203001 8/15/2015

Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	500	510	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	70.7	73.7	°F
Mean stack velocity	3109	3124	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	997.8	996.6	mbar
Ambient humidity	26.5%	23.4%	RH
Ambient Temp	20.8	21.9	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6,.6,.6,.5,.6	.8,.6,.5,.5,.5	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/9/2015

Notes: Start data for GT-22 is the finish data for GT-21

CA 3/10/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/10/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-23**
Date	3/11/2015	Fan Configuration	**Fan A&B Min**
Testers	CA,EA	Fan Setting	**18.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	55.95 deg F
Stack X-Area	111.6 in.2	Start/End Time	830/948
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Center I2**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	27.3	26.6	26.1	26.7	33.5	31.5	31.7	32.2
2	1.25	26.8	25.3	25.7	25.9	32.7	28.6	29.5	30.3
3	2.31	25.3	24.4	23.6	24.4	28.4	27.9	28.4	28.2
4	3.85	23.5	22.0	22.9	22.8	24.8	26.4	26.3	25.8
Center	5.96	22.9	22.2	22.9	22.7	23.9	24.8	22.9	23.9
5	8.07	24.7	24.6	24.1	24.5	22.2	22.0	22.2	22.1
6	9.61	25.5	25.0	25.4	25.3	21.3	21.6	21.8	21.6
7	10.67	26.3	28.3	27.6	27.4	20.4	21.9	22.8	21.7
8	11.42	28.6	28.2	27.2	28.0	19.6	21.5	22.3	21.1
Averages ---------->		25.7	25.2	25.1	25.3	25.2	25.1	25.3	25.2

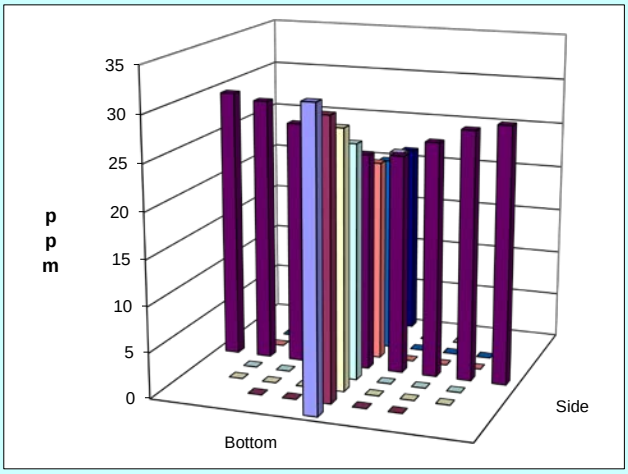
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	25.26		Mean	24.71	24.80	24.76
Min Point	21.13	-16.3%	Std. Dev.	1.69	3.43	2.60
Max Point	32.23	27.6%	COV as %	6.8	13.8	**10.5**

Avg. Conc. 25.506 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	590	590	psig
Injection flowmeter	0.8	0.8	slpm
Stack Temp	55	56.9	°F
Mean stack velocity	1681	1593	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	999.3	1000.0	mbar
Ambient humidity	32.0%	46.5%	RH
Ambient Temp	20.5	16.2	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.7,.7,.7,.6,.6	.6,.6,.6,.6.6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/9/2015

Notes:

CA 3/11/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/11/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-24**
Date	3/11/2015	Fan Configuration	**Fan A&B Min**
Testers	CA,EA	Fan Setting	**18.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	56.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	950/1100
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Far wall I2**

		1st				2nd			
Order -->									
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	21.0	20.4	20.0	20.5	26.3	25.1	23.8	25.1
2	1.25	21.2	20.0	20.9	20.7	23.7	25.2	24.1	24.3
3	2.31	22.9	21.8	23.2	22.6	24.4	24.4	25.3	24.7
4	3.85	23.5	24.6	23.8	24.0	26.4	26.2	26.8	26.5
Center	5.96	25.4	25.6	25.9	25.6	26.9	26.4	25.5	26.3
5	8.07	27.7	27.1	27.9	27.6	25.0	25.3	25.0	25.1
6	9.61	29.1	29.4	28.7	29.1	24.5	23.6	24.8	24.3
7	10.67	30.1	30.8	28.7	29.9	26.0	24.2	25.1	25.1
8	11.42	31.2	29.3	30.2	30.2	25.8	25.6	24.8	25.4
Averages ---------->		25.8	25.4	25.5	25.6	25.4	25.1	25.0	25.2

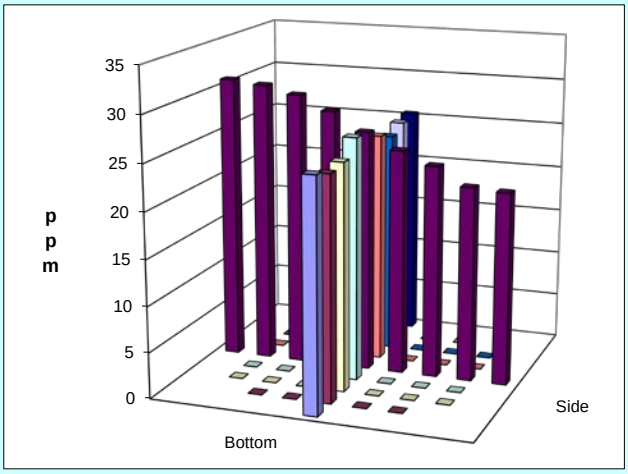
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	25.38		Mean	25.63	25.18	25.41
Min Point	20.47	-19.4%	Std. Dev.	3.40	0.87	2.40
Max Point	30.23	19.1%	COV as %	13.3	3.5	**9.4**

Avg. Conc. 25.310 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	590	590	psig
Injection flowmeter	0.8	0.8	slpm
Stack Temp	55	58	°F
Mean stack velocity	1593	1625	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1000.0	1000.0	mbar
Ambient humidity	45.9%	43.2%	RH
Ambient Temp	16.2	16.8	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.5,.5,.5,.5,.5	.8,.6,.6,.5.6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/9/2015

Notes:

CA 3/11/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/11/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-25**
Date	3/11/2015	Fan Configuration	**Fan A&B Min**
Testers	CA,EA	Fan Setting	**18.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	69 deg F
Stack X-Area	111.6 in.2	Start/End Time	130/240
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Near wall I2**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	31.0	30.1	28.4	29.8	26.5	25.6	24.7	25.6
2	1.25	30.3	29.1	27.4	28.9	25.1	24.0	24.4	24.5
3	2.31	28.5	27.4	26.6	27.5	24.7	24.0	23.2	24.0
4	3.85	26.8	27.0	25.2	26.3	25.7	24.8	24.7	25.1
Center	5.96	25.2	24.9	25.0	25.0	26.3	26.0	24.9	25.7
5	8.07	22.2	22.3	22.8	22.4	27.6	26.5	26.5	26.9
6	9.61	21.2	22.2	20.7	21.4	31.1	31.3	29.9	30.8
7	10.67	22.0	21.9	20.4	21.4	32.5	29.3	31.3	31.0
8	11.42	19.1	18.6	18.7	18.8	31.1	32.8	28.4	30.8
Averages ---------->		25.1	24.8	23.9	24.6	27.8	27.1	26.4	27.1

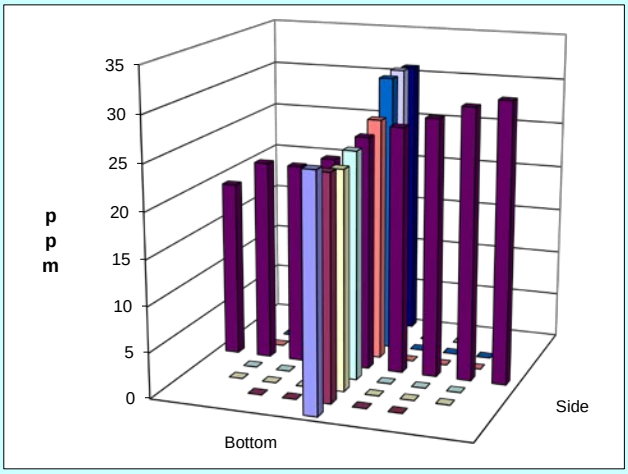
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	25.89		Mean	24.72	26.85	25.78
Min Point	18.80	-27.4%	Std. Dev.	3.04	2.92	3.07
Max Point	31.03	19.9%	COV as %	12.3	10.9	**11.9**

Avg. Conc. 25.950 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	600	600	psig
Injection flowmeter	0.8	0.8	slpm
Stack Temp	68.7	69.3	°F
Mean stack velocity	1610	1667	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	999.9	999.4	mbar
Ambient humidity	32.3%	35.0%	RH
Ambient Temp	20.1	21.1	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6,.6,.6,.6,.6	.7,.7,.5,.5,.5	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/9/2015

Notes:

CA 3/11/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/11/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-26**
Date	3/12/2015	Fan Configuration	**Fan A&B Min**
Testers	CA,EA	Fan Setting	**18.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	57.38105 deg F
Stack X-Area	111.6 in.2	Start/End Time	815/935
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Bottom wall I2**

		2nd				1st			
Order -->									
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	24.4	24.0	23.5	24.0	24.9	25.5	25.2	25.2
2	1.25	24.3	25.1	24.0	24.5	25.8	24.8	25.4	25.3
3	2.31	24.9	24.4	24.4	24.6	26.1	25.2	25.4	25.6
4	3.85	25.0	24.9	24.6	24.8	25.6	25.3	25.6	25.5
Center	5.96	25.4	25.3	25.3	25.3	26.3	25.9	25.4	25.9
5	8.07	26.2	25.6	25.4	25.7	26.3	25.7	25.8	25.9
6	9.61	26.5	25.2	26.1	25.9	25.4	25.7	25.6	25.6
7	10.67	25.7	26.3	25.9	26.0	25.5	25.2	25.7	25.5
8	11.42	26.6	25.3	26.3	26.1	25.6	25.3	24.5	25.1
Averages ---------->		25.4	25.1	25.1	25.2	25.7	25.4	25.4	25.5

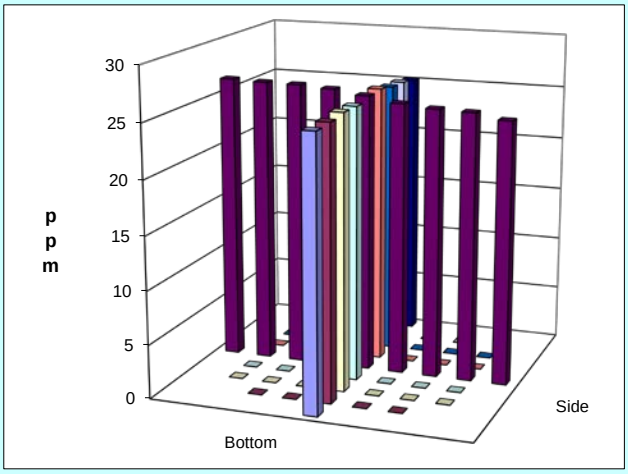
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	25.36		Mean	25.26	25.60	25.43
Min Point	23.97	-5.5%	Std. Dev.	0.64	0.22	0.49
Max Point	26.07	2.8%	COV as %	2.5	0.8	**1.9**

Avg. Conc. 25.327 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	530	550	psig
Injection flowmeter	0.8	0.8	slpm
Stack Temp	54.2	60.6	°F
Mean stack velocity	1610	1662	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1013	1013	mbar
Ambient humidity	50.6%	56.5%	RH
Ambient Temp	16.6	16.0	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6,.5,.6,.6,.6	.7,.6,.5,.5,.5	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/9/2015

Notes:

CA 3/12/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/12/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-27**
Date	3/12/2015	Fan Configuration	**Fan A&B Min**
Testers	CA,EA	Fan Setting	**18.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	63.45 deg F
Stack X-Area	111.6 in.2	Start/End Time	815/935
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Top wall I2**

		1st				2nd			
Order -->									
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	19.9	20.8	21.9	20.9	25.0	23.8	22.9	23.9
2	1.25	21.3	21.3	20.2	20.9	24.8	23.6	24.2	24.2
3	2.31	22.7	21.7	21.1	21.8	24.9	25.1	24.5	24.8
4	3.85	22.7	22.9	22.6	22.7	24.9	25.0	25.1	25.0
Center	5.96	23.6	25.6	24.8	24.7	25.1	25.7	26.0	25.6
5	8.07	26.0	25.9	27.6	26.5	25.5	25.5	24.6	25.2
6	9.61	27.9	27.1	27.9	27.6	26.7	25.8	24.6	25.7
7	10.67	28.5	28.8	27.7	28.3	24.2	29.6	25.5	26.4
8	11.42	27.8	28.1	28.8	28.2	27.5	25.3	26.4	26.4
Averages ---------->		24.5	24.7	24.7	24.6	25.4	25.5	24.9	25.3

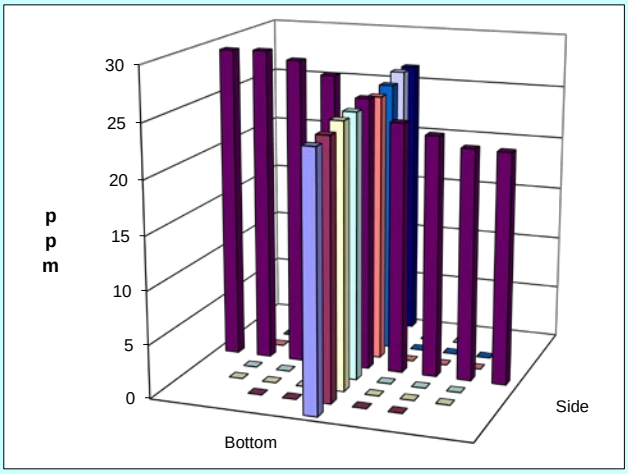
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	24.94		Mean	24.66	25.28	24.97
Min Point	20.87	-16.3%	Std. Dev.	2.92	0.71	2.07
Max Point	28.33	13.6%	COV as %	11.9	2.8	**8.3**

Avg. Conc. 24.921 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	550	590	psig
Injection flowmeter	0.8	0.8	slpm
Stack Temp	60.6	66.3	°F
Mean stack velocity	1662	1633	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1013	1014	mbar
Ambient humidity	56.6%	48.6%	RH
Ambient Temp	16.0	18.6	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.7,.6,.5,.5,.5	.7,.6,.5,.6,.5	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/9/2015

Notes: Start data for GT-27 are the finish data for GT-26

CA 3/12/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	3/12/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-28**
Date	3/13/2015	Fan Configuration	**Fan A&B min**
Testers	CA, EA	Fan Setting	**18.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	49.35 deg F
Stack X-Area	111.6 in.2	Start/End Time	830 / 947
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Near Wall I2**

Order -->		2nd				st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	28.6	29.8	29.1	29.2	24.5	24.4	24.3	24.4
2	1.25	27.8	29.3	28.3	28.5	23.3	24.4	23.3	23.7
3	2.31	27.7	27.1	26.6	27.1	24.8	23.9	22.6	23.8
4	3.85	25.2	25.4	24.7	25.1	24.3	23.9	24.5	24.2
Center	5.96	24.1	24.3	24.3	24.2	24.5	23.4	24.2	24.0
5	8.07	22.5	20.7	22.3	21.8	25.0	26.3	26.6	26.0
6	9.61	21.8	20.9	22.2	21.6	26.5	27.5	25.6	26.5
7	10.67	20.8	19.9	19.8	20.2	25.4	26.4	27.8	26.5
8	11.42	20.8	19.8	21.6	20.7	29.1	29.5	27.5	28.7
Averages ---------->		24.4	24.1	24.3	24.3	25.3	25.5	25.2	25.3

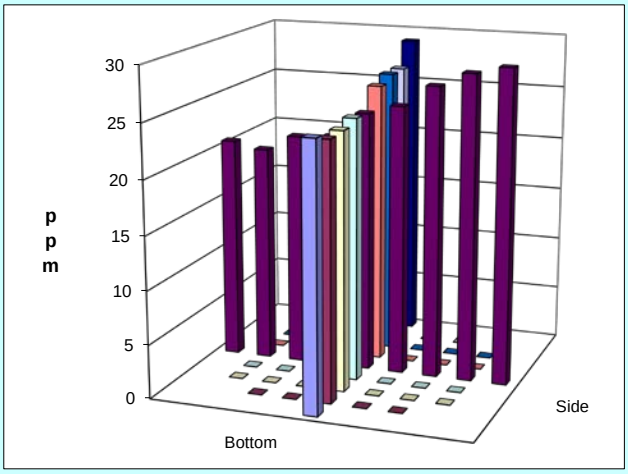
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	24.79		Mean	24.08	24.96	24.52
Min Point	20.17	-18.7%	Std. Dev.	3.05	1.32	2.31
Max Point	29.17	17.6%	COV as %	12.7	5.3	**9.4**

Avg. Conc. 24.877 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	490	550	psig
Injection flowmeter	0.8	0.8	slpm
Stack Temp	44.3	54.4	°F
Mean stack velocity	1597	1581	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1012	1012	mbar
Ambient humidity	43.7%	25.2%	RH
Ambient Temp	14.5	23.6	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.7, .6, .6, .6, .6	.7, .6, .5, .5, .6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/9/2015

Notes:

CA 3/13/2015

Entries made by:	Carmen Arimescu
Signature/date	3/13/2015
	Signature on file with Original

Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	6/10/2015
	Signature on file in TI-WTPSP-137

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-29**
Date	3/13/2015	Fan Configuration	**Fan A&B Min**
Testers	CA, EA	Fan Setting	**18.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	57.4 deg F
Stack X-Area	111.6 in.2	Start/End Time	0953 / 1055
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Near Wall I2**

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	28.4	27.5	28.0	28.0	24.7	23.4	24.3	24.1
2	1.25	27.4	27.6	28.7	27.9	25.1	23.4	22.9	23.8
3	2.31	25.5	26.6	26.8	26.3	23.0	24.8	23.2	23.7
4	3.85	24.3	25.4	25.4	25.0	23.2	23.4	23.0	23.2
Center	5.96	25.4	24.6	23.9	24.6	23.7	23.9	24.1	23.9
5	8.07	22.3	22.3	21.8	22.1	28.1	26.7	25.5	26.8
6	9.61	20.8	20.8	20.6	20.7	28.1	28.0	26.2	27.4
7	10.67	21.3	20.4	21.0	20.9	26.8	28.2	28.5	27.8
8	11.42	21.5	19.6	20.4	20.5	30.3	31.9	28.1	30.1
Averages ---------->		24.1	23.9	24.1	24.0	25.9	26.0	25.1	25.6

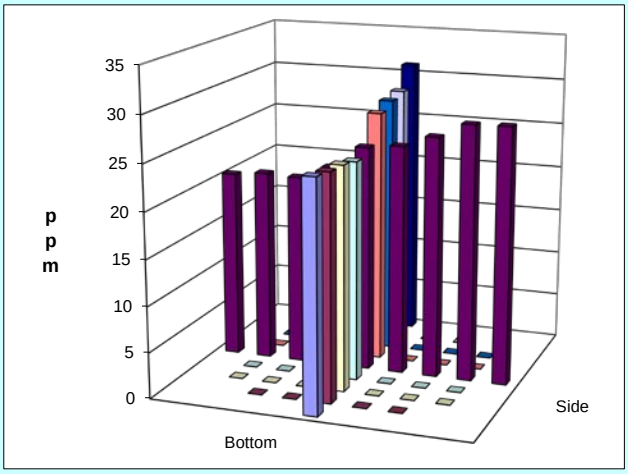
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	24.83		Mean	23.95	25.23	24.59
Min Point	20.50	-17.4%	Std. Dev.	2.76	2.02	2.42
Max Point	30.10	21.2%	COV as %	11.5	8.0	**9.8**

Avg. Conc. 24.900 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	550	550	psig
Injection flowmeter	0.8	0.8	slpm
Stack Temp	54.4	60.4	°F
Mean stack velocity	1581	1627	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1012	1011	mbar
Ambient humidity	25%	38%	RH
Ambient Temp	23.6	17.1	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.7, .6, .5, .5, .6	.8, .6, .6, .6, .6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/9/2015

Notes: Start data for GT-29 is the finish data for GT-28.

CA 3/13/2015

Entries made by:	Carmen Arimescu
Signature/date	3/13/2015
	Signature on file with Original

Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	6/10/2015
	Signature on file in TI-WTPSP-137

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-30**
Date	3/16/2015	Fan Configuration	**Fan A&B Max**
Testers	CA, EA	Fan Setting	**34** **Hz**
Stack Dia.	11.922 in.	Stack Temp	59.8 deg F
Stack X-Area	111.6 in.2	Start/End Time	1020/1130
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Near Wall I2**

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	20.6	21.7	20.5	20.9	27.5	27.3	27.3	27.4
2	1.25	21.9	21.6	21.1	21.5	26.6	26.6	26.4	26.5
3	2.31	22.8	22.2	23.8	22.9	27.6	27.7	27.5	27.6
4	3.85	24.9	24.7	25.0	24.9	27.3	27.1	26.2	26.9
Center	5.96	26.6	26.3	26.3	26.4	27.6	26.8	26.9	27.1
5	8.07	28.2	28.6	28.8	28.5	26.6	26.6	26.1	26.4
6	9.61	29.1	30.5	30.3	30.0	24.5	25.9	25.1	25.2
7	10.67	29.2	30.9	31.4	30.5	24.8	24.0	23.0	23.9
8	11.42	30.9	31.0	30.9	30.9	24.2	24.0	22.9	23.7
Averages ---------->		26.0	26.4	26.5	26.3				26.1

All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	26.18		Mean	26.39	26.23	26.31
Min Point	20.93	-20.1%	Std. Dev.	3.47	1.26	2.51
Max Point	30.93	18.1%	COV as %	13.1	4.8	**9.5**

Avg. Conc. 26.113 ppm

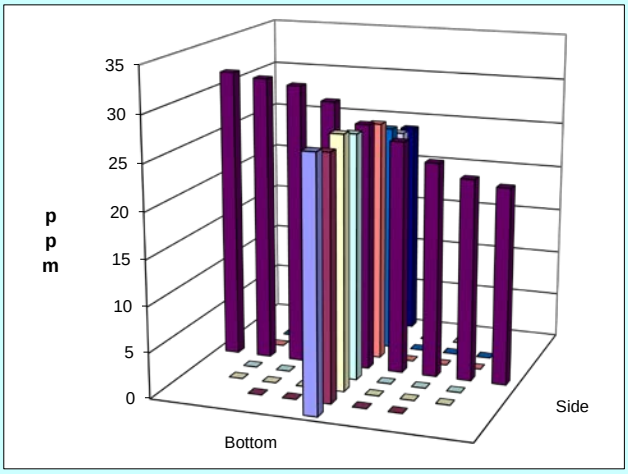
Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE

TSI Velocicalc SN#T95351203001 8/15/2015

Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	500	500	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	58.9	60.7	°F
Mean stack velocity	3158	3114	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1010	1009	mbar
Ambient humidity	54.8%	46.9%	RH
Ambient Temp	14.1	15.6	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6, .6, .6, .6, .6	.8, .6, .6, .6, .6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/16/2015

Notes:

CA 3/16/2015

Entries made by:	Carmen Arimescu
Signature/date	3/16/2015
	Signature on file with Original

Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	6/10/2015
	Signature on file in TI-WTPSP-137

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-31**
Date	3/17/2015	Fan Configuration	**Fan A&B Max**
Testers	CA, EA	Fan Setting	**34** **Hz**
Stack Dia.	11.922 in.	Stack Temp	51.6 deg F
Stack X-Area	111.6 in.2	Start/End Time	830/947
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	**Near Wall I2**

		1st				2nd			
Order -->									
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	21.8	22.1	21.0	21.6	25.7	26.2	25.2	25.7
2	1.25	22.8	22.0	22.4	22.4	26.0	27.1	26.6	26.6
3	2.31	24.2	23.2	24.2	23.9	27.3	27.0	26.5	26.9
4	3.85	25.0	25.4	25.4	25.3	26.6	26.8	27.1	26.8
Center	5.96	27.5	26.7	27.1	27.1	27.2	27.1	26.2	26.8
5	8.07	28.8	29.1	29.1	29.0	26.1	26.0	26.6	26.2
6	9.61	30.9	29.8	30.7	30.5	25.2	24.5	25.2	25.0
7	10.67	30.8	30.5	30.8	30.7	24.6	24.6	23.2	24.1
8	11.42	30.8	31.9	32.0	31.6	22.7	24.0	22.7	23.1
Averages ---------->		27.0	26.7	27.0	26.9	25.7	25.9	25.5	25.7

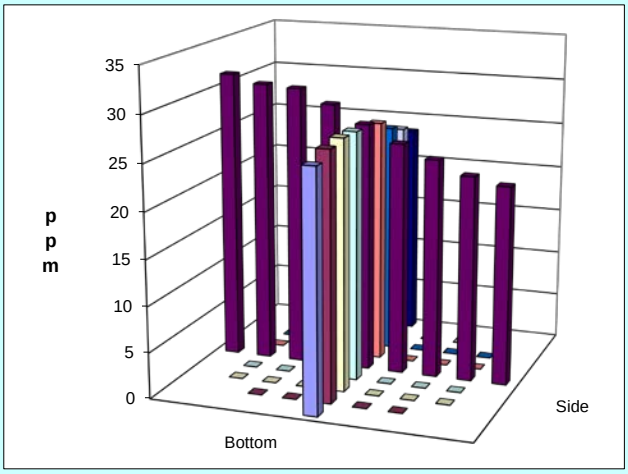
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	26.30		Mean	26.97	26.07	26.52
Min Point	21.63	-17.7%	Std. Dev.	3.26	1.09	2.38
Max Point	31.57	20.0%	COV as %	12.1	4.2	**9.0**

Avg. Conc. 26.213 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	500	600	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	50.3	52.9	°F
Mean stack velocity	3096	3223	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1004	1004	mbar
Ambient humidity	46.8%	39.6%	RH
Ambient Temp	18.3	21.5	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6, .6, .6, .6, .6	.7, .6, .6, .5, .4	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 3/16/2015

Notes:

CA 3/17/2015

Entries made by:	Carmen Arimescu
Signature/date	3/17/2015
	Signature on file with Original

Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	6/10/2015
	Signature on file in TI-WTPSP-137

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-32**
Date	5/18/2015	Fan Configuration	Fan B Max
Testers	CA, EA	Fan Setting	53 Hz
Stack Dia.	11.922 in.	Stack Temp	73.1 deg F
Stack X-Area	111.6 in.2	Start/End Time	9:10/10:30
Test Port		Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	I3 Center

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	25.1	26.2	25.5	25.6	25.7	25.3	25.0	25.3
2	1.25	25.3	25.1	25.4	25.3	25.8	25.5	25.2	25.5
3	2.31	25.7	25.8	25.7	25.7	25.9	25.6	26.3	25.9
4	3.85	26.7	26.4	26.1	26.4	26.5	25.9	26.0	26.1
Center	5.96	27.6	27.6	27.1	27.4	27.6	27.7	27.2	27.5
5	8.07	27.5	27.3	27.6	27.5	29.1	28.9	29.0	29.0
6	9.61	28.1	27.6	28.3	28.0	30.4	30.0	30.3	30.2
7	10.67	28.5	28.5	27.5	28.2	30.8	30.5	30.2	30.5
8	11.42	28.4	28.2	28.5	28.4	30.9	30.9	29.9	30.6
Averages ---------->		27.0	27.0	26.9	26.9	28.1	27.8	27.7	27.9

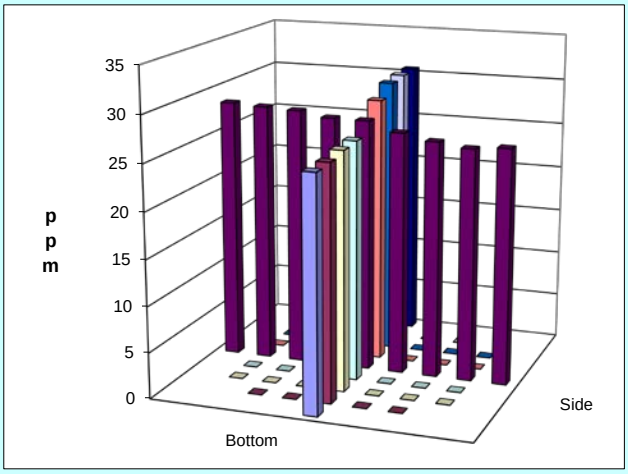
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	27.40		Mean	26.92	27.83	27.38
Min Point	25.27	-7.8%	Std. Dev.	1.13	2.09	1.68
Max Point	30.57	11.6%	COV as %	4.2	7.5	**6.1**

Avg. Conc. 27.388 ppm

	Start	Finish	
Tracer tank pressure	600	600	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	71.1	75.1	°F
Mean stack velocity	3073	3138	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1003	1002	mbar
Ambient humidity	37.4%	31.5%	RH
Ambient Temp	20.8	23.1	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas			ppm
	.6, .5, .6, .6,.5	.7, .5, .5, .5 .5	
No. Bk-Gd samples	5	5	n

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI Velocicalc SN#T95351203001		8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen		
	122277883	8/7/2015



Gas analyzer checked: 5/18/2015

Notes: GT-32 is a repeat of GT-1

CA 5/18/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	5/18/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-33**
Date	5/18/2015	Fan Configuration	Fan B Max
Testers	CA, EA	Fan Setting	53 Hz
Stack Dia.	11.922 in.	Stack Temp	76.3 deg F
Stack X-Area	111.6 in.2	Start/End Time	10:33/11:30
Test Port		Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	I3 1.5 in from far wall

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	26.9	26.3	26.5	26.6	25.6	25.8	25.2	25.5
2	1.25	27.3	27.0	27.1	27.1	26.0	26.0	26.0	26.0
3	2.31	27.0	27.0	27.0	27.0	26.6	26.2	26.3	26.4
4	3.85	28.0	27.6	27.7	27.8	27.1	26.8	27.4	27.1
Center	5.96	28.0	28.1	27.7	27.9	27.6	28.0	28.4	28.0
5	8.07	28.5	27.7	27.8	28.0	28.1	28.3	28.1	28.2
6	9.61	27.7	27.2	27.3	27.4	28.0	27.7	27.9	27.9
7	10.67	26.8	26.3	26.6	26.6	27.6	27.5	27.7	27.6
8	11.42	26.2	25.7	26.4	26.1	28.0	27.9	28.1	28.0
Averages ---------->		27.4	27.0	27.1	27.2	27.2	27.1	27.2	27.2

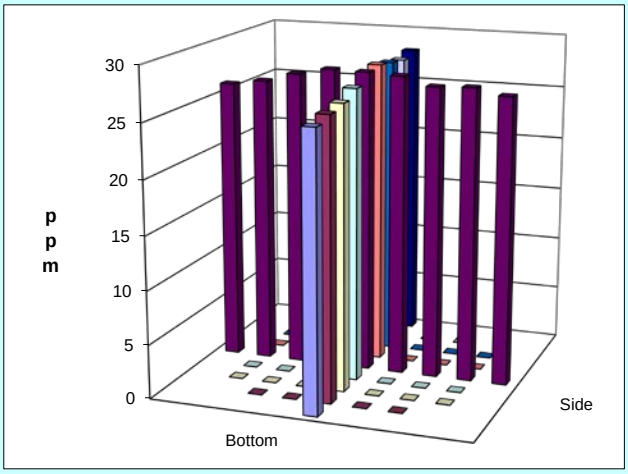
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	27.17		Mean	27.40	27.30	27.35
Min Point	25.53	-6.0%	Std. Dev.	0.53	0.84	0.68
Max Point	28.17	3.7%	COV as %	1.9	3.1	**2.5**

Avg. Conc. 27.073 ppm

Instuments Used:

B&K 1302 Gas Analyzer	SN 1804888	Cat2 M&TE
TSI Velocicalc SN#T95351203001		8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen		
	122277883	8/7/2015

	Start	Finish	
Tracer tank pressure	600	700	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	75.1	77.5	°F
Mean stack velocity	3138	3038	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1002	1002	mbar
Ambient humidity	31.5%	28.7%	RH
Ambient Temp	23.1	24.0	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas			ppm
	.7, .5, .5, .5 .5	.7, .5, .5, .5 .5	
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 5/18/2015

Notes: Start data for GT-33 is the Finish data from GT-32
GT-33 repeat of GT-2

CA 5/18/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	0
Signature/date	5/18/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-34**
Date	5/19/2015	Fan Configuration	Fan B Max
Testers	CA, EA	Fan Setting	55 Hz
Stack Dia.	11.922 in.	Stack Temp	69.15 deg F
Stack X-Area	111.6 in.2	Start/End Time	8:20/9:35
Test Port		Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	I3 1.5 in from Near Wall

Order -->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	28.0	27.8	27.8	27.9	28.7	28.6	28.3	28.5
2	1.25	28.2	27.8	27.0	27.7	29.0	28.0	28.2	28.4
3	2.31	27.5	27.3	27.2	27.3	28.4	27.8	27.8	28.0
4	3.85	26.9	26.5	26.6	26.7	27.7	27.5	27.5	27.6
Center	5.96	26.3	26.2	25.9	26.1	26.8	26.5	26.4	26.6
5	8.07	26.1	25.5	25.9	25.8	25.8	25.9	25.7	25.8
6	9.61	25.9	25.9	26.0	25.9	25.0	25.3	25.3	25.2
7	10.67	25.7	25.7	25.4	25.6	25.5	24.9	25.1	25.2
8	11.42	25.8	26.1	26.0	26.0	24.6	25.0	25.0	24.9
Averages ---------->		26.7	26.5	26.4	26.6	26.8	26.6	26.6	26.7

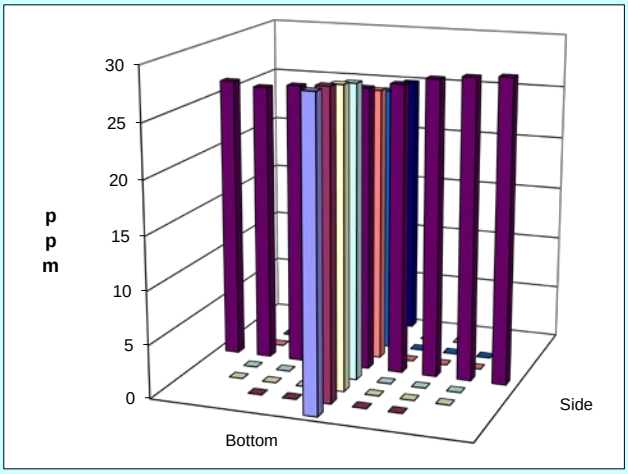
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	26.62		Mean	26.45	26.67	26.56
Min Point	24.87	-6.6%	Std. Dev.	0.79	1.34	1.06
Max Point	28.53	7.2%	COV as %	3.0	5.0	**4.0**

Avg. Conc. 26.650 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	675	650	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	66.9	71.4	°F
Mean stack velocity	3141	3163	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1001	1001	mbar
Ambient humidity	46.7%	41.7%	RH
Ambient Temp	18.9	21.2	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.6,.6,.6,.6,.6	.7,.5,.5,.5,.6	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 5/18/2015

Notes: GT-34 is a repeat of GT-3

CA 5/19/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	5/19/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

TRACER GAS TRAVERSE DATA FORM

Site	**LV-C2 _Rem Scale Model**	Run No.	**GT-35**
Date	5/19/2015	Fan Configuration	Fan B Max
Testers	CA, EA	Fan Setting	55 Hz
Stack Dia.	11.922 in.	Stack Temp	74.65 deg F
Stack X-Area	111.6 in.2	Start/End Time	937/1042
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	ppm N2O	Injection Point	I3 Top

Order -->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	ppm				ppm			
1	0.50	25.6	26.1	25.8	25.8	26.2	26.5	27.2	26.6
2	1.25	25.5	26.0	25.7	25.7	26.5	26.2	26.3	26.3
3	2.31	25.7	25.7	25.7	25.7	26.4	26.1	26.3	26.3
4	3.85	25.5	25.8	25.8	25.7	26.0	26.3	26.3	26.2
Center	5.96	25.3	25.5	25.5	25.4	25.9	25.9	25.8	25.9
5	8.07	25.9	25.8	26.0	25.9	25.8	26.3	25.6	25.9
6	9.61	26.2	26.4	26.2	26.3	26.3	26.2	25.7	26.1
7	10.67	27.0	26.6	26.7	26.8	26.1	26.5	26.2	26.3
8	11.42	27.4	27.2	26.9	27.2	26.0	26.7	26.3	26.3
Averages ---------->		26.0	26.1	26.0	26.1	26.1	26.3	26.2	26.2

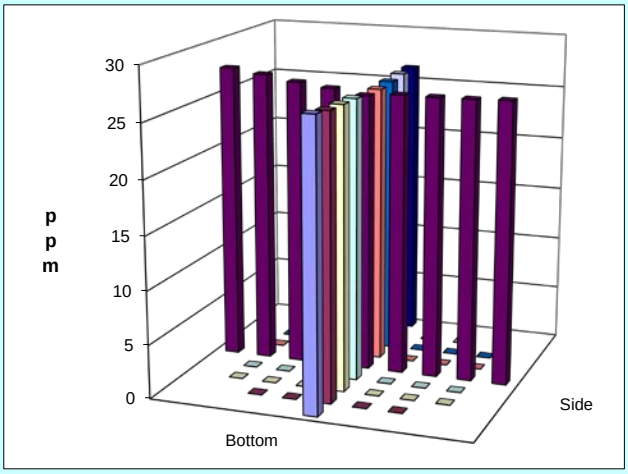
All	ppm	Dev. from mean	***Center 2/3***	Side	Bottom	All
Mean	26.13		Mean	25.93	26.13	26.03
Min Point	25.43	-2.7%	Std. Dev.	0.45	0.19	0.35
Max Point	27.17	4.0%	COV as %	1.7	0.7	**1.3**

Avg. Conc. 26.192 ppm

Instuments Used:

B&K 1302 Gas Analyzer SN 1804888 Cat2 M&TE
TSI Velocicalc SN#T95351203001 8/15/2015
Fisher Scientific Barometer Hydro/Therm/Baro/Dew Point Pen 122277883 8/7/2015

	Start	Finish	
Tracer tank pressure	650	650	psig
Injection flowmeter	1.6	1.6	slpm
Stack Temp	71.4	77.9	°F
Mean stack velocity	3163	3178	afpm
Sampling flowmeter	10	10	lpm
Ambient pressure	1001	1000	mbar
Ambient humidity	41.7%	37.1%	RH
Ambient Temp	21.2	24.2	°C
B&K vapor correction	Y	Y	Y/N
Back-Gd gas	.7,.5,.5,.5,.6	.5,.5,.6,.5,.7	ppm
No. Bk-Gd samples	5	5	n



Gas analyzer checked: 5/18/2015

Notes: Start data for GT-35 is Finish data from GT-34
GT-35 is a repeat of GT-4

CA 5/19/2015

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Xiao-Ying Yu
Signature/date	5/19/2015	Signature/date	6/10/2015
	Signature on file with original	Signature on file in TI-WTPSP-137	

C.4 LV-C2 Particle Tracer Uniformity Data Sheets

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-1**
Date	11/7/2014	Fan configuration	**Fan B** Previous Max Flow
Tester	CA, EA	Fan Setting	55 **Hz**
Stack Dia.	11.922 in.	Stack Temp	65.1 deg F
Stack X-Area	111.6 in.2	Start/End Time	11:00AM/13:20PM
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	Oversize 90 on

		Side				Bottom			
Order ----->		2				1			
Traverse-->									
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	378	601	532	503.7	978	851	753	860.7
2	1.25	542	555	582	559.7	1251	1235	1174	1220.0
3	2.31	676	591	718	661.7	1351	1318	1306	1325.0
4	3.85	935	798	821	851.3	1332	1398	1275	1335.0
Center	5.96	798	758	832	796.0	1146	1226	1100	1157.3
5	8.07	786	759	797	780.7	880	853	790	841.0
6	9.61	703	785	757	748.3	756	730	692	726.0
7	10.67	759	770	687	738.7	671	607	537	605.0
8	11.42	602	567	524	564.3	485	502	423	470.0
Averages ---------->		686.6	687.1	694.4	689.4	983.3	968.9	894.4	948.9

All	pt/ft3	Dev. from mean
Mean	819.1	
Min Point	470.0	-42.6%
Max Point	1335.0	63.0%

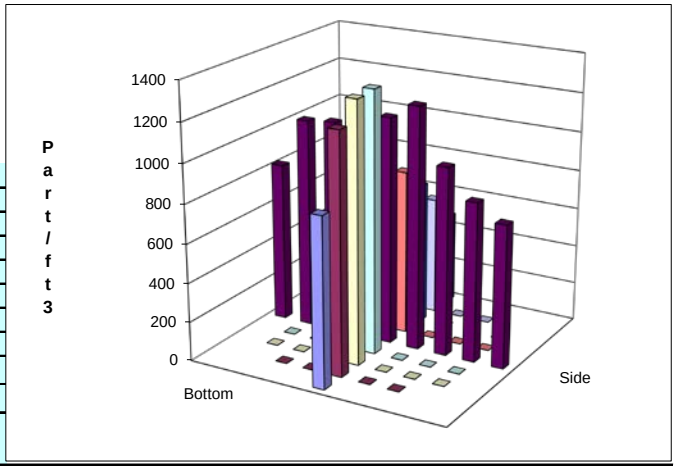
Center 2/3	Side	Bottom	All	Normlzd
Mean	733.8	1029.9	881.8	1048.37
Std. Dev.	96.3	300.3	263.7	225.92
COV as %	13.1	29.2	**29.9**	**21.55**

Avg Conc 799 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Baro/De		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	64.5	65.7	F
Mean Velocity	3993	3923	afpm
Ambient pressure	29.97	29.95	inHg
Ambient humidity	25.5%	33.2%	RH
Ambient temp	57	61	F
Back-Gd aerosol	4,3,2,3,1	0,2,3,3,3	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	32	50	psig



Notes:

CA 11/7/2014

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 11/7/2014
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-2**
Date	11/7/2014	Fan configuration	**Fan B** Previous Max Flow
Tester	CA, EA	Fan Setting	**55** **Hz**
Stack Dia.	11.922 in.	Stack Temp	64.65 deg F
Stack X-Area	111.6 in.2	Start/End Time	1:30PM/3:30PM
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I2**
		Damper Configuration	Oversize 90 on

Order ----->					1				2			
Traverse-->					Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	599	672	614	628.3	681	695	661	679.0
2	1.25	805	714	759	759.3	954	874	886	904.7
3	2.31	839	757	822	806.0	1033	961	936	976.7
4	3.85	941	850	909	900.0	1032	916	954	967.3
Center	5.96	944	887	886	905.7	885	848	807	846.7
5	8.07	880	790	848	839.3	530	561	546	545.7
6	9.61	729	688	743	720.0	371	395	382	382.7
7	10.67	533	607	599	579.7	288	271	269	276.0
8	11.42	425	416	452	431.0	210	196	191	199.0
Averages ---------->		743.9	709.0	736.9	729.9	664.9	635.2	625.8	642.0

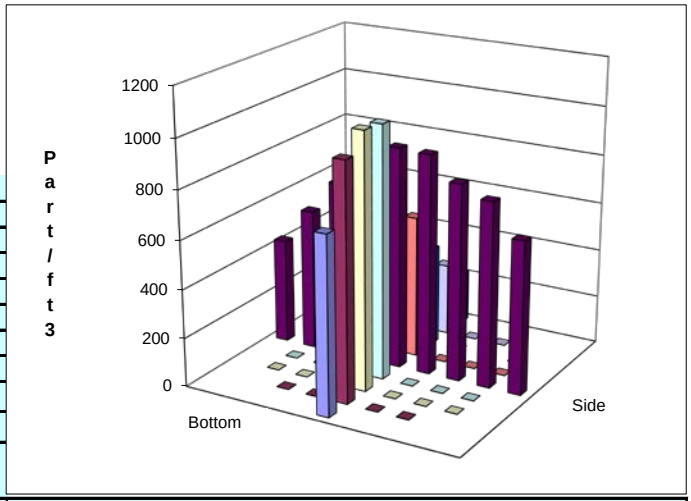
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	685.9		Mean	787.1	700.0	743.5	767.94
Min Point	199.0	-71.0%	Std. Dev.	114.2	293.2	218.5	227.60
Max Point	976.7	42.4%	COV as %	14.5	41.9	**29.4**	**29.64**

Avg Conc 662 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	65.7	63.6	F
Mean Velocity	3923	3983	afpm
Ambient pressure	29.95	29.94	inHg
Ambient humidity	33.2%	42.8%	RH
Ambient temp	61	60	F
Back-Gd aerosol	0,0,2,3,0	0,3,0,2,3	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	32	45	psig



Notes:

CA 11/7/2014

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Julia Flaherty
Signature/date	11/7/2014	Signature/date	5/5/2015
	Signature on file with original		Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-3**
Date	11/10/2014	Fan configuration	**Fan B** Previous Max Flow
Tester	CA, JEF	Fan Setting	**55.1** **Hz**
Stack Dia.	11.922 in.	Stack Temp	53.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	10:00/11:30
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	Oversize 90 on

Order ----->		2				1			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	326	280	463	356.3	359	327	344	343.3
2	1.25	304	439	571	438.0	467	447	503	472.3
3	2.31	320	471	493	428.0	542	547	564	551.0
4	3.85	539	536	570	548.3	637	579	602	606.0
Center	5.96	423	597	529	516.3	545	513	581	546.3
5	8.07	521	621	442	528.0	347	353	408	369.3
6	9.61	501	495	326	440.7	269	336	366	323.7
7	10.67	332	273	234	279.7	234	304	295	277.7
8	11.42	121	119	169	136.3	181	245	242	222.7
Averages ---------->		376.3	425.7	421.9	408.0	397.9	405.7	433.9	412.5

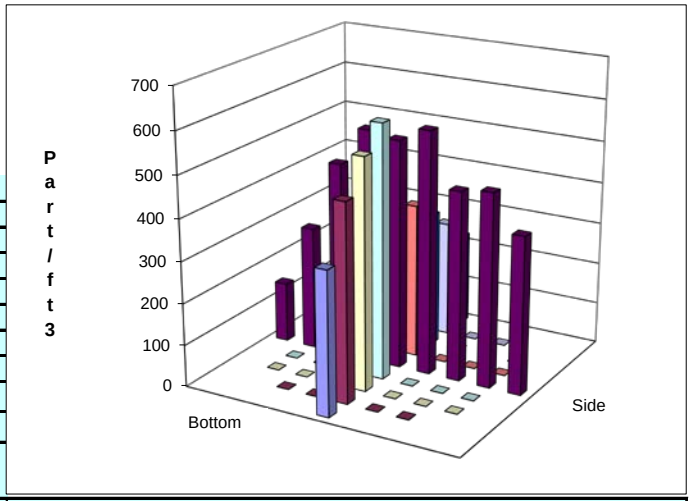
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	410.2		Mean	454.1	449.5	451.8	465.00
Min Point	136.3	-66.8%	Std. Dev.	91.1	126.8	106.1	109.39
Max Point	606.0	47.7%	COV as %	20.1	28.2	**23.5**	**23.53**

Avg Conc 395 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	50.9	56.1	F
Mean Velocity	4083	3884	afpm
Ambient pressure	29.78	29.76	inHg
Ambient humidity	22.4%	16.2%	RH
Ambient temp	44.0	46.0	F
Back-Gd aerosol	4,3,3,2,0	0,0,2,3,0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	40	50	psig



Notes:

CA 11/10/2014

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Ernest Antonio
Signature/date	11/10/2014	Signature/date	5/20/2015
	Signature on file with original		Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-4**
Date	11/10/2014	Fan configuration	**Fan B** Revised Max Flow
Tester	CA, JEF	Fan Setting	**47** **Hz**
Stack Dia.	11.922 in.	Stack Temp	56.85 deg F
Stack X-Area	111.6 in.2	Start/End Time	1152/1300
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	Oversize 90 on

	Order ----->	1				2			
	Traverse-->	Side				Bottom			
	Trial ---->	1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	715	1018	769	834.0	806	905	807	839.3
2	1.25	955	992	1092	1013.0	1178	1195	1104	1159.0
3	2.31	1015	1100	1084	1066.3	1305	1307	1195	1269.0
4	3.85	1050	1141	1143	1111.3	1321	1293	1210	1274.7
Center	5.96	1066	1221	1157	1148.0	1219	1087	1087	1131.0
5	8.07	1005	1165	1135	1101.7	749	651	621	673.7
6	9.61	925	1084	1169	1059.3	391	324	348	354.3
7	10.67	775	966	991	910.7	232	209	230	223.7
8	11.42	396	567	640	534.3	124	138	129	130.3
Averages ---------->		878.0	1028.2	1020.0	975.4	813.9	789.9	747.9	783.9

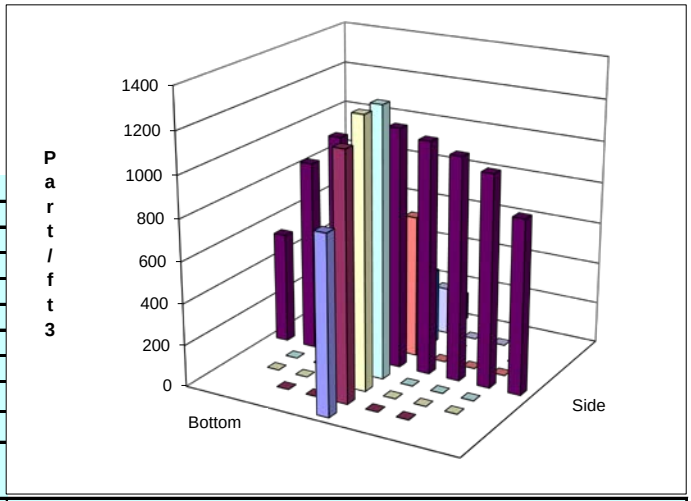
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	879.6		Mean	1058.6	869.3	964.0	970.51
Min Point	130.3	-85.2%	Std. Dev.	78.2	446.6	323.3	325.62
Max Point	1274.7	44.9%	COV as %	7.4	51.4	**33.5**	**33.55**

Avg Conc 847 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	54.3	59.4	F
Mean Velocity	3203	3320	afpm
Ambient pressure	29.76	29.74	inHg
Ambient humidity	16.2%	18.4%	RH
Ambient temp	46	48	F
Back-Gd aerosol	1,1,1,1,0	2,0,1,1,1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	45	50	psig



Notes:

CA 11/10/2014

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Ernest Antonio
Signature/date	11/10/2014	Signature/date	5/20/2015
	Signature on file with original		Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-5**
Date	11/10/2014	Fan configuration	**B Max (revised)**
Tester	JAG, EA	Fan Setting	**46** **Hz**
Stack Dia.	11.922 in.	Stack Temp	56.1 deg F
Stack X-Area	111.6 in.2	Start/End Time	1309 / 2:30
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I2**
		Damper Configuration	Oversize 90 on

Order ----->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	281	456	476	404.3	812	836	783	810.3
2	1.25	471	483	599	517.7	1089	1074	1089	1084.0
3	2.31	529	534	562	541.7	1120	1073	1119	1104.0
4	3.85	595	693	646	644.7	1185	1081	1135	1133.7
Center	5.96	716	666	738	706.7	1145	1002	1042	1063.0
5	8.07	658	673	631	654.0	691	624	586	633.7
6	9.61	679	731	668	692.7	366	331	302	333.0
7	10.67	586	555	532	557.7	213	193	241	215.7
8	11.42	442	456	308	402.0	138	149	136	141.0
Averages ---------->		550.8	583.0	573.3	569.0	751.0	707.0	714.8	724.3

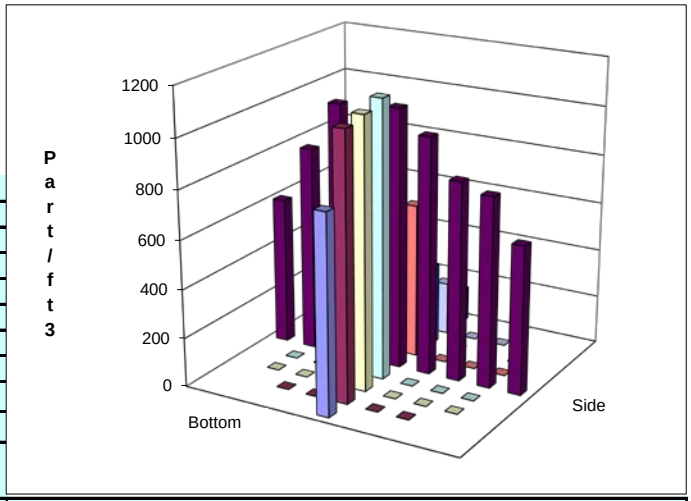
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	646.6		Mean	616.4	795.3	705.9	861.27
Min Point	141.0	-78.2%	Std. Dev.	76.3	395.9	289.2	288.32
Max Point	1133.7	75.3%	COV as %	12.4	49.8	**41.0**	**33.48**

Avg Conc 617 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3	3	psig
Stack Temp	56.2	56	F
Mean Velocity	3210	3247	afpm
Ambient pressure	29.74	29.73	inHg
Ambient humidity	21%	18%	RH
Ambient temp	48	51	F
Back-Gd aerosol	1, 2, 1, 1,. 2	1, 2, 1, 2, 1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	52	44	psig



Notes: Velocity readings taken at side center

JAG 11/10/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by:	JAG	Technical Data Review performed by:	Carmen Arimescu
Signature/date	11/10/2014	Signature/date	2/23/2015
	Signature on file with original		Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-6**
Date	11/10/2014	Fan configuration	**Fan B Revised Max**
Tester	EA, CA	Fan Setting	**46** **Hz**
Stack Dia.	11.922 in.	Stack Temp	54.15 deg F
Stack X-Area	111.6 in.2	Start/End Time	240 / 414
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I2**
		Damper Configuration	Oversize 90 on

Order ----->					1				2			
Traverse-->					Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	302	411	396	369.7	449	528	468	481.7
2	1.25	344	471	440	418.3	488	608	647	581.0
3	2.31	467	481	503	483.7	540	678	657	625.0
4	3.85	490	548	561	533.0	590	719	735	681.3
Center	5.96	613	599	573	595.0	529	684	757	656.7
5	8.07	556	599	525	560.0	430	534	511	491.7
6	9.61	582	561	604	582.3	354	466	478	432.7
7	10.67	428	420	489	445.7	380	456	416	417.3
8	11.42	359	333	294	328.7	370	423	361	384.7
Averages ---------->		460.1	491.4	487.2	479.6	458.9	566.2	558.9	528.0

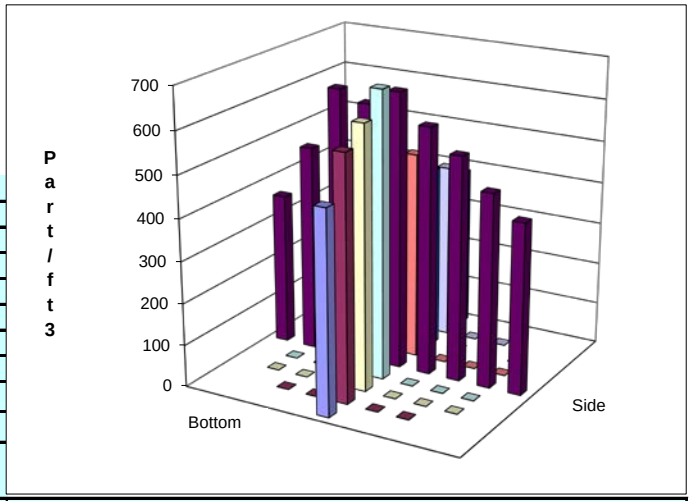
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	503.8		Mean	516.9	555.1	536.0	562.76
Min Point	328.7	-34.8%	Std. Dev.	68.8	107.9	89.1	89.96
Max Point	681.3	35.2%	COV as %	13.3	19.4	**16.6**	**15.99**

Avg Conc 489 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	56	52.3	F
Mean Velocity	3247	3391	afpm
Ambient pressure	29.43	29.74	inHg
Ambient humidity	18.3%	24.1%	RH
Ambient temp	51	51	F
Back-Gd aerosol	1, 2, 1, 2, 1	0, 2, 1, 2, 0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	44	46	psig



Notes: CA 11/10/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: CA 11/10/14
Signature/date
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-7**		
Date	11/13/2014	Fan configuration	**B Max (Previous)**		
Tester	CA, EA	Fan Setting	**55**	**Hz**	
Stack Dia.	11.922 in.	Stack Temp	58.5 deg F		
Stack X-Area	111.6 in.2	Start/End Time	1:40 / 3:14		
Test Port	1	Center 2/3 from	1.09	to:	10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2	to:	7
Measurement units	particles/ft3	Injection Point	I2		
		Damper Configuration	**Oversize 90° off**		

Order ----->		2nd							1st	
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	particles/ft3				particles/ft3				
1	0.50	184	303	317	268.0	297	296	291	294.7	
2	1.25	257	289	357	301.0	350	379	381	370.0	
3	2.31	328	349	374	350.3	402	471	464	445.7	
4	3.85	412	396	434	414.0	488	513	532	511.0	
Center	5.96	426	493	497	472.0	493	515	503	503.7	
5	8.07	555	528	535	539.3	426	425	425	425.3	
6	9.61	563	572	541	558.7	347	377	347	357.0	
7	10.67	628	572	601	600.3	323	290	343	318.7	
8	11.42	548	487	402	479.0	273	266	249	262.7	
Averages ---------->		433.4	443.2	450.9	442.5	377.7	392.4	392.8	387.6	

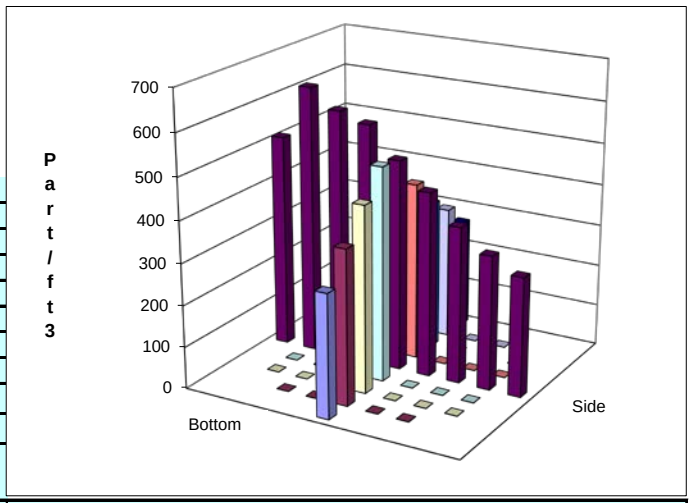
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	415.1		Mean	462.2	418.8	440.5	456.01
Min Point	262.7	-36.7%	Std. Dev.	112.0	73.8	93.9	102.96
Max Point	600.3	44.6%	COV as %	24.2	17.6	**21.3**	**22.58**

Avg Conc 406 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	58	59	F
Mean Velocity	3786	3738	afpm
Ambient pressure	29.71	29.7	inHg
Ambient humidity	17%	15%	RH
Ambient temp	55.4	57	F
Back-Gd aerosol	8, 7, 3, 9, 2	4, 2, 4, 2, 4	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	47	48	psig



Notes: We measured temp. inside the tent.

CA 11/13/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: CA 11/13/14
Signature/date
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-8**
Date	11/14/2014	Fan configuration	**B Max (Previous)**
Tester	CA, EA	Fan Setting	**55** **Hz**
Stack Dia.	11.922 in.	Stack Temp	56.15 deg F
Stack X-Area	111.6 in.2	Start/End Time	9:20 / 11:15
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	**Oversize 90° off**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 / 0.50	296	269	310	291.7	507	515	524	515.3
2 / 1.25	273	342	421	345.3	529	545	605	559.7
3 / 2.31	364	350	393	369.0	603	613	675	630.3
4 / 3.85	467	507	519	497.7	717	742	782	747.0
Center / 5.96	584	591	618	597.7	790	772	789	783.7
5 / 8.07	592	662	688	647.3	690	674	691	685.0
6 / 9.61	633	715	700	682.7	548	561	530	546.3
7 / 10.67	690	660	757	702.3	454	497	476	475.7
8 / 11.42	504	548	613	555.0	380	363	409	384.0
Averages ---------->	489.2	516.0	557.7	521.0	579.8	586.9	609.0	591.9

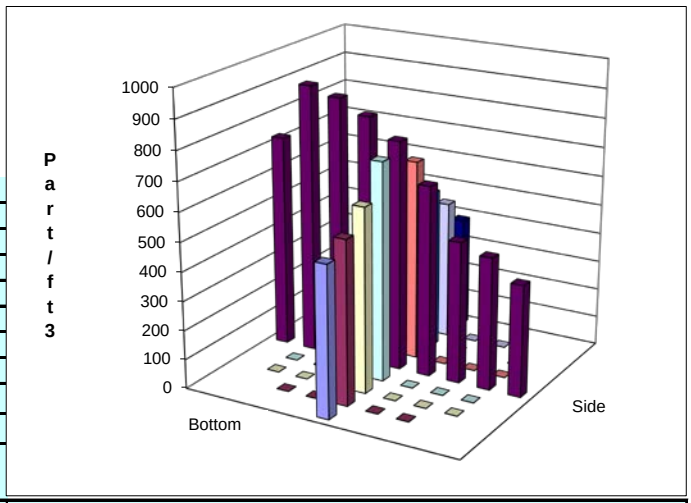
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	556.4		Mean	548.9	632.5	590.7	676.10
Min Point	291.7	-47.6%	Std. Dev.	147.2	112.6	133.2	158.36
Max Point	783.7	40.8%	COV as %	26.8	17.8	**22.5**	**23.42**

Avg Conc 540 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.5	3.5	psig
Stack Temp	51.2	61.1	F
Mean Velocity	3914	3804	afpm
Ambient pressure	29.7	29.75	inHg
Ambient humidity	33%	21%	RH
Ambient temp	44	53.6	F
Back-Gd aerosol	2, 1, 3, 2, 6	1, 2, 5, 1	pt/ft3
No. Bk-Gd samples	5	4	
Compressor output	46	48	psig



Notes:

CA 11/14/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by:	CA 11/14/14	Technical Data Review performed by:	Julia Flaherty
Signature/date	Signature on file with original	Signature/date	5/5/2015 Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-9**
Date	11/14/2014	Fan configuration	**B Max (Previous)**
Tester	CA, EA	Fan Setting	**55** **Hz**
Stack Dia.	11.922 in.	Stack Temp	64.6 deg F
Stack X-Area	111.6 in.2	Start/End Time	1315/1442
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	**Oversize 90° off**

Order ----->		2nd				1st				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	particles/ft3				particles/ft3				
1	0.50	341	607	610	519.3	598	655	635	629.3	
2	1.25	582	718	734	678.0	688	721	743	717.3	
3	2.31	693	710	674	692.3	770	755	802	775.7	
4	3.85	764	741	745	750.0	861	866	939	888.7	
Center	5.96	789	781	803	791.0	891	941	1038	956.7	
5	8.07	871	871	794	845.3	844	836	831	837.0	
6	9.61	934	854	848	878.7	668	756	695	706.3	
7	10.67	840	761	741	780.7	604	663	589	618.7	
8	11.42	670	671	609	650.0	505	532	505	514.0	
Averages ---------->		720.4	746.0	728.7	731.7	714.3	747.2	753.0	738.2	

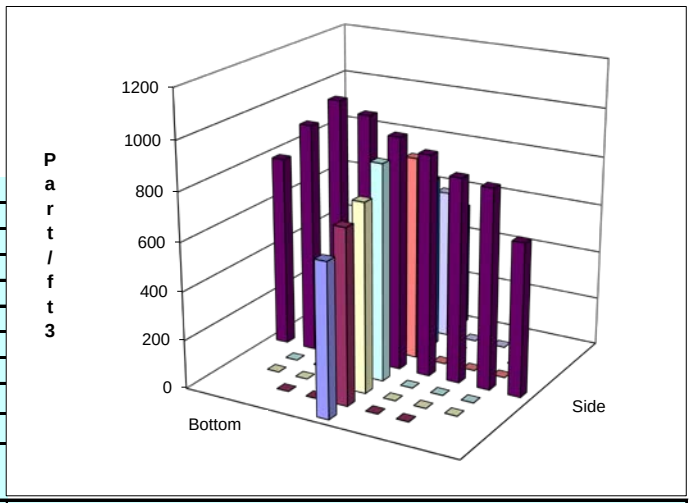
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	734.9		Mean	773.7	785.8	779.7	860.76
Min Point	514.0	-30.1%	Std. Dev.	74.0	116.5	94.0	126.56
Max Point	956.7	30.2%	COV as %	9.6	14.8	**12.1**	**14.70**

Avg Conc 718 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.5	3.5	psig
Stack Temp	64.7	64.5	F
Mean Velocity	3870	3876	afpm
Ambient pressure	29.7	29.7	inHg
Ambient humidity	18%	15%	RH
Ambient temp	59.6	62	F
Back-Gd aerosol	2,2,0,1,2	0,0,1,2,2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	50	48	psig



Notes:

CA 11/14/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: CA 11/14/14
Signature/date
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-10**
Date	11/14/2014	Fan configuration	**B Max (Revized)**
Tester	CA, EA	Fan Setting	**46** **Hz**
Stack Dia.	11.922 in.	Stack Temp	64.3 deg F
Stack X-Area	111.6 in.2	Start/End Time	1450/1615
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	**Oversize 90° off**

		1st				2nd			
Order ----->									
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	380	415	395	396.7	589	740	637	655.3
2	1.25	427	397	468	430.7	775	795	783	784.3
3	2.31	517	531	556	534.7	737	810	847	798.0
4	3.85	748	676	708	710.7	810	871	874	851.7
Center	5.96	841	864	854	853.0	787	913	892	864.0
5	8.07	971	853	954	926.0	700	771	833	768.0
6	9.61	1156	1032	1048	1078.7	583	753	733	689.7
7	10.67	1226	1160	1132	1172.7	515	562	598	558.3
8	11.42	1161	1050	1038	1083.0	449	495	442	462.0
Averages ---------->		825.2	775.3	794.8	798.4	660.6	745.6	737.7	714.6

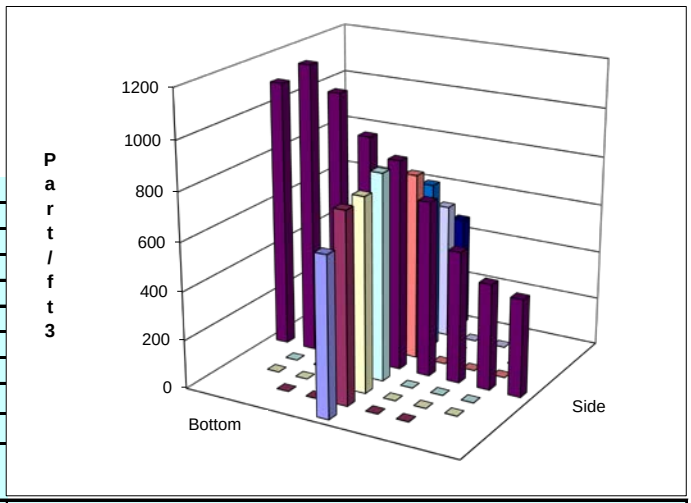
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	756.5		Mean	815.2	759.1	787.2	792.42
Min Point	396.7	-47.6%	Std. Dev.	273.4	105.6	201.2	204.28
Max Point	1172.7	55.0%	COV as %	33.5	13.9	**25.6**	**25.78**

Avg Conc 744 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	65.6	63	F
Mean Velocity	3257	3242	afpm
Ambient pressure	29.7	29.7	inHg
Ambient humidity	15.4%	16.9%	RH
Ambient temp	62.0	59.0	F
Back-Gd aerosol	1,1,1,0,2	2,1,1,0,2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	46	psig



Notes:

CA 11/14/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by:	CA 11/14/14	Technical Data Review performed by:	Julia Flaherty
Signature/date		Signature/date	5/5/2015
	Signature on file with original		Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-11**
Date	11/19/2014	Fan configuration	**FanB Max (Revized)**
Tester	CA, JAG	Fan Setting	**46.1** **Hz**
Stack Dia.	11.922 in.	Stack Temp	55.05 deg F
Stack X-Area	111.6 in.2	Start/End Time	1100/1315
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	**Oversize 90° off**

Order ----->	2nd				1st			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 / 0.50	580	567	511	552.7	409	465	563	479.0
2 / 1.25	576	651	643	623.3	606	451	680	579.0
3 / 2.31	648	641	707	665.3	644	610	771	675.0
4 / 3.85	769	780	801	783.3	883	691	919	831.0
Center / 5.96	925	938	1034	965.7	924	881	964	923.0
5 / 8.07	1082	1014	1037	1044.3	956	882	915	917.7
6 / 9.61	1089	1046	1122	1085.7	824	829	821	824.7
7 / 10.67	1045	1119	1127	1097.0	780	780	896	818.7
8 / 11.42	998	1029	1017	1014.7	726	677	751	718.0
Averages ---------->	856.9	865.0	888.8	870.2	750.2	696.2	808.9	751.8

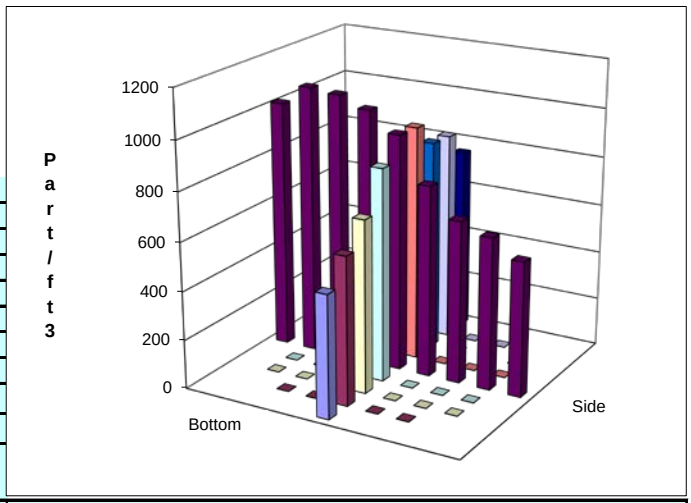
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	811.0		Mean	895.0	795.6	845.3	863.65
Min Point	479.0	-40.9%	Std. Dev.	201.4	126.0	169.4	166.74
Max Point	1097.0	35.3%	COV as %	22.5	15.8	**20.0**	**19.31**

Avg Conc 794 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	54	56.1	F
Mean Velocity	3186	3158	afpm
Ambient pressure	29.84	29.77	inHg
Ambient humidity	33.9%	35.4%	RH
Ambient temp	51.8	48.2	F
Back-Gd aerosol	1,1,2,2,3	1,1,1,1,1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	42	46	psig



Notes:

CA 11/14/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: CA 11/14/14
Signature/date
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-12**
Date	11/19/2014	Fan configuration	**FanB Max (Revized)**
Tester	CA, JEF	Fan Setting	**46.1** **Hz**
Stack Dia.	11.922 in.	Stack Temp	55.85 deg F
Stack X-Area	111.6 in.2	Start/End Time	1320/1635
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	**Oversize 90° off**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 / 0.50	544	643	622	603.0	388	737	696	607.0
2 / 1.25	695	684	688	689.0	612	939	999	850.0
3 / 2.31	780	779	791	783.3	1006	1047	1305	1119.3
4 / 3.85	908	915	900	907.7	1143	1043	973	1053.0
Center / 5.96	1109	1065	1037	1070.3	1195	1152	1099	1148.7
5 / 8.07	1208	1135	1126	1156.3	1102	1125	1111	1112.7
6 / 9.61	1173	1090	1110	1124.3	1003	958	983	981.3
7 / 10.67	1106	1071	1060	1079.0	808	901	883	864.0
8 / 11.42	809	830	816	818.3	667	721	707	698.3
Averages ---------->	925.8	912.4	905.6	914.6	880.4	958.1	972.9	937.1

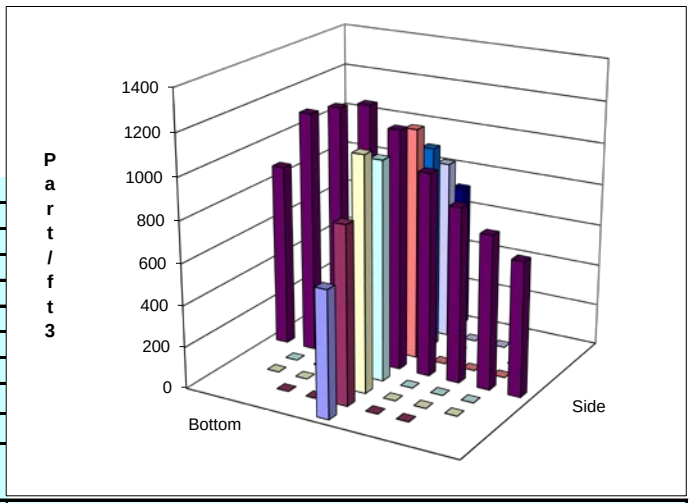
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	925.9		Mean	972.9	1018.4	995.6	1031.24
Min Point	603.0	-34.9%	Std. Dev.	181.7	123.0	150.9	157.21
Max Point	1156.3	24.9%	COV as %	18.7	12.1	**15.2**	**15.24**

Avg Conc 903 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	56.1	55.6	F
Mean Velocity	3158	3123	afpm
Ambient pressure	29.77	29.74	inHg
Ambient humidity	35.4%	28.6%	RH
Ambient temp	48.2	53.6	F
Back-Gd aerosol	1,0,1,1,3	4,1,3,4,3	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	46	46	psig



Notes:

CA 11/19/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: CA 11/19/14
Signature/date
Signature on file with original

Technical Data Review performed by: Ernest Antonio
Signature/date 5/20/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-13**
Date	11/20/2014	Fan configuration	**FanB Max (previous)**
Tester	CA, XYY	Fan Setting	**60** **Hz**
Stack Dia.	11.922 in.	Stack Temp	63.7 deg F
Stack X-Area	111.6 in.2	Start/End Time	1100/1315
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	**Scale**

Order ----->		2nd				1st				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	particles/ft3				particles/ft3				
1	0.50	161	189	188	179.3	483	706	595	594.7	
2	1.25	190	203	199	197.3	417	768	733	639.3	
3	2.31	232	237	219	229.3	585	869	831	761.7	
4	3.85	268	295	261	274.7	803	901	934	879.3	
Center	5.96	339	340	324	334.3	951	959	1002	970.7	
5	8.07	392	360	311	354.3	1011	998	1088	1032.3	
6	9.61	353	317	318	329.3	1039	911	960	970.0	
7	10.67	337	325	332	331.3	943	846	852	880.3	
8	11.42	253	230	253	245.3	812	700	752	754.7	
Averages ---------->		280.6	277.3	267.2	275.0	782.7	850.9	860.8	831.4	

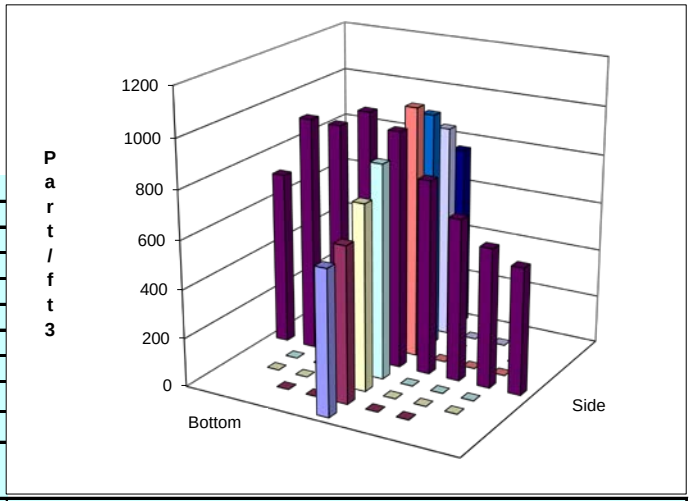
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	553.2		Mean	293.0	876.2	584.6	863.38
Min Point	179.3	-67.6%	Std. Dev.	60.3	136.2	319.1	151.26
Max Point	1032.3	86.6%	COV as %	20.6	15.5	**54.6**	**17.52**

Avg Conc 541 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	2.8	2.8	psig
Stack Temp	63	64.4	F
Mean Velocity	3129	3192	afpm
Ambient pressure	29.7	29.7	inHg
Ambient humidity	35.0%	34.3%	RH
Ambient temp	59	59	F
Back-Gd aerosol	7,11,8,7,5	2,2,7,4,1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	48	psig



Notes:

CA 11/20/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: CA 11/20/14
Signature/date
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-14**
Date	11/20/2014	Fan configuration	**FanB Max (previous)**
Tester	JAG,JEF	Fan Setting	**60** **Hz**
Stack Dia.	11.922 in.	Stack Temp	63.75 deg F
Stack X-Area	111.6 in.2	Start/End Time	1326/1500
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	613	607	628	616.0	392	353	261	335.3
2 1.25	699	780	716	731.7	552	490	411	484.3
3 2.31	751	819	736	768.7	671	643	577	630.3
4 3.85	949	845	875	889.7	929	811	828	856.0
Center 5.96	1027	1064	1005	1032.0	1112	1036	1049	1065.7
5 8.07	1069	1023	1156	1082.7	1194	1144	1102	1146.7
6 9.61	1049	1028	1082	1053.0	1206	1120	1079	1135.0
7 10.67	1014	1043	1028	1028.3	1119	1049	1039	1069.0
8 11.42	587	525	586	566.0	989	905	902	932.0
Averages ---------->	862.0	859.3	868.0	863.1	907.1	839.0	805.3	850.5

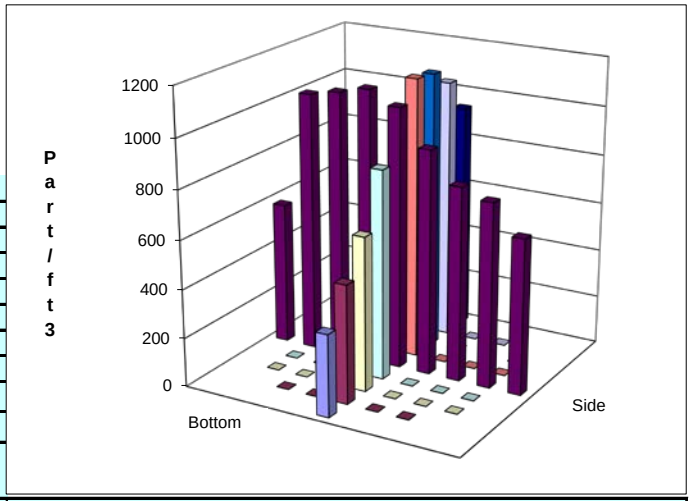
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	856.8		Mean	940.9	912.4	926.6	941.99
Min Point	335.3	-60.9%	Std. Dev.	144.2	264.1	204.9	208.22
Max Point	1146.7	33.8%	COV as %	15.3	28.9	**22.1**	**22.10**

Avg Conc 833 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	2.8	2.8	psig
Stack Temp	64.5	63	F
Mean Velocity	3208	3172	afpm
Ambient pressure	29.67	29.67	inHg
Ambient humidity	37.7%	34.0%	RH
Ambient temp	58	58	F
Back-Gd aerosol	0,1,1,4,1	2,1,2,5,0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	49	psig



Notes: Closed backdraft damper on Fan A.

JAG 11/20/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: JAG 11/20/14
Signature/date
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 2/24/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-15**
Date	11/20/2014	Fan configuration	**FanB Max (previous)**
Tester	JEF,JAG	Fan Setting	**60** **Hz**
Stack Dia.	11.922 in.	Stack Temp	62.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	1500/1623
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	**Scale**

Order ----->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	649	662	680	663.7	205	179	182	188.7
2	1.25	726	727	756	736.3	314	299	320	311.0
3	2.31	742	749	823	771.3	493	376	409	426.0
4	3.85	837	866	845	849.3	619	597	633	616.3
Center	5.96	915	941	903	919.7	821	815	780	805.3
5	8.07	904	858	867	876.3	927	955	904	928.7
6	9.61	907	843	753	834.3	920	941	932	931.0
7	10.67	845	769	764	792.7	885	885	853	874.3
8	11.42	654	590	625	623.0	697	707	746	716.7
Averages ---------->		797.7	778.3	779.6	785.2	653.4	639.3	639.9	644.2

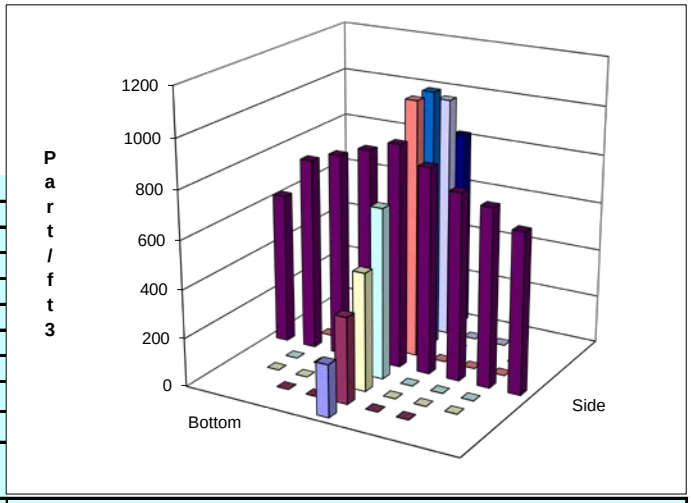
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	714.7		Mean	825.7	699.0	762.3	811.95
Min Point	188.7	-73.6%	Std. Dev.	63.3	251.8	188.3	200.57
Max Point	931.0	30.3%	COV as %	7.7	36.0	**24.7**	**24.70**

Avg Conc 696 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	2.8	2.8	psig
Stack Temp	63	62	F
Mean Velocity	3172	3173	afpm
Ambient pressure	29.67	29.65	inHg
Ambient humidity	34.0%	35.4%	RH
Ambient temp	58	58	F
Back-Gd aerosol	2,1,2,5,0	1,1,4,2,5	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	49	45	psig



Notes: Closed backdraft damper on Fan A.

JAG 11/20/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: JAG 11/20/14
Signature/date
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 2/24/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-16**
Date	11/21/2014	Fan configuration	**FanB Max (revized)**
Tester	CA,JAG	Fan Setting	**50.3** **Hz**
Stack Dia.	11.922 in.	Stack Temp	64.15 deg F
Stack X-Area	111.6 in.2	Start/End Time	1000/1205
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	**Scale**

Order ----->	2nd				1st			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	390	424	497	437.0	326	376	533	411.7
2 1.25	540	487	585	537.3	538	571	809	639.3
3 2.31	693	731	783	735.7	760	777	913	816.7
4 3.85	934	973	965	957.3	887	955	1036	959.3
Center 5.96	1205	1141	1206	1184.0	1125	1142	1111	1126.0
5 8.07	1155	1225	1237	1205.7	1170	1203	1227	1200.0
6 9.61	1226	1152	1230	1202.7	1161	1209	1216	1195.3
7 10.67	1298	1046	1304	1216.0	1099	1091	1118	1102.7
8 11.42	1109	1071	1137	1105.7	942	828	924	898.0
Averages ---------->	950.0	916.7	993.8	953.5	889.8	905.8	987.4	927.7

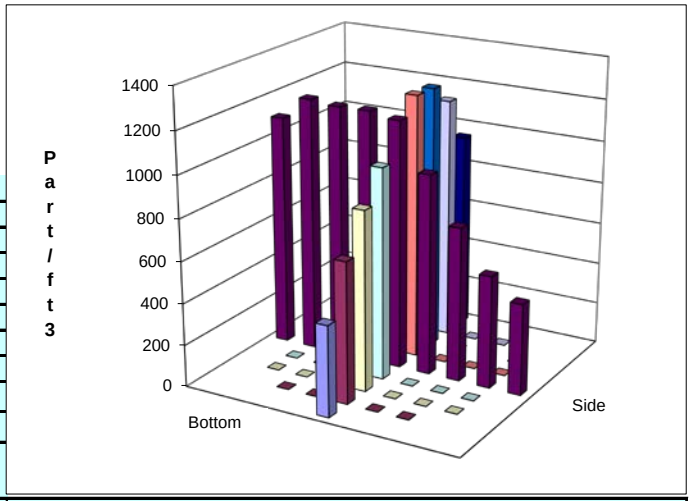
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	940.6		Mean	1005.5	1005.6	1005.6	1031.47
Min Point	411.7	-56.2%	Std. Dev.	273.7	212.0	235.2	241.32
Max Point	1216.0	29.3%	COV as %	27.2	21.1	**23.4**	**23.40**

Avg Conc 914 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	2.8	2.8	psig
Stack Temp	64.3	64	F
Mean Velocity	2703	2788	afpm
Ambient pressure	29.5	29.45	inHg
Ambient humidity	45.0%	46.5%	RH
Ambient temp	55.4	53.6	F
Back-Gd aerosol	0,3,0,6,2	1,0,1,1,1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	40	48	psig



Notes: Fan A backdraft damper is closed, B is open

CA 11/21/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: CA 11/21/14
Signature/date
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-17**
Date	11/25/2014	Fan configuration	**Fan B Max**
Tester	EA, JEF	Fan Setting	**55** **Hz**
Stack Dia.	11.922 in.	Stack Temp	49.55 deg F
Stack X-Area	111.6 in.2	Start/End Time	0911 / 1100
Test Port	1D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	131.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I2**
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 / 0.50	821	813	866	833.3	512	469	724	568.3
2 / 1.25	1016	1071	1055	1047.3	1156	834	1223	1071.0
3 / 2.31	1061	1116	1042	1073.0	1363	1425	1413	1400.3
4 / 3.85	1159	1195	1154	1169.3	1475	1452	1574	1500.3
Center / 5.96	1280	1350	1378	1336.0	1541	1476	1579	1532.0
5 / 8.07	1213	1272	1388	1291.0	1336	1236	1409	1327.0
6 / 9.61	1152	1236	1330	1239.3	1254	1205	1197	1218.7
7 / 10.67	1033	1144	1231	1136.0	1138	1156	1153	1149.0
8 / 11.42	534	803	793	710.0	311	179	454	314.7
Averages ---------->	1029.9	1111.1	1137.4	1092.8	1120.7	1048.0	1191.8	1120.1

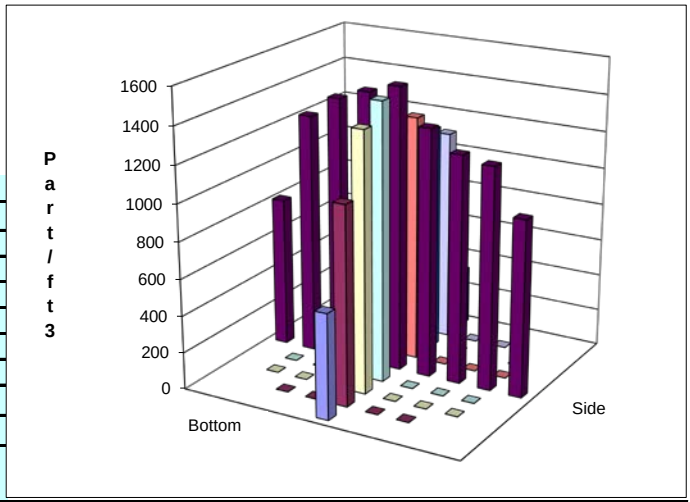
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	1106.5		Mean	1184.6	1314.0	1249.3	1336.20
Min Point	314.7	-71.6%	Std. Dev.	108.9	175.7	155.7	148.23
Max Point	1532.0	38.5%	COV as %	9.2	13.4	**12.5**	**11.09**

Avg Conc 1066 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
N/A			

	Start	Finish	
Generator Inlet Press	2.8	2.8	psig
Stack Temp	49.7	49.4	F
Mean Velocity	3069	2945	afpm
Ambient pressure	29.72	29.76	inHg
Ambient humidity	47%	40%	RH
Ambient temp	15.5	19.5	C
Back-Gd aerosol	3, 1, 3, 6, 1	0, 3, 1, 1, 4	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	28	46	psig



Notes: Ambient temp measured inside tent.

Fan B damper open 70°, Fan A damper closed.

EA 11/25/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: Ernest Antonio
Signature/date 11/25/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 2/24/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-18**
Date	11/25/2014	Fan configuration	**Fan B Max**
Tester	EA, JEF	Fan Setting	**58.1** **Hz**
Stack Dia.	11.922 in.	Stack Temp	51.55 deg F
Stack X-Area	111.6 in.2	Start/End Time	1100 / 1230
Test Port	1D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	131.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I2**
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	1007	877	895	926.3	465	461	480	468.7
2 1.25	1082	1029	1052	1054.3	918	845	911	891.3
3 2.31	1147	1135	1164	1148.7	1063	1002	1038	1034.3
4 3.85	1268	1213	1221	1234.0	1290	1261	1251	1267.3
Center 5.96	1344	1423	1482	1416.3	1404	1377	1271	1350.7
5 8.07	1355	1413	1454	1407.3	1189	1207	1163	1186.3
6 9.61	1391	1331	1379	1367.0	1137	1118	1115	1123.3
7 10.67	1318	1236	1256	1270.0	1144	1209	1164	1172.3
8 11.42	633	725	733	697.0	311	462	376	383.0
Averages ---------->	1171.7	1153.6	1181.8	1169.0	991.2	993.6	974.3	986.4

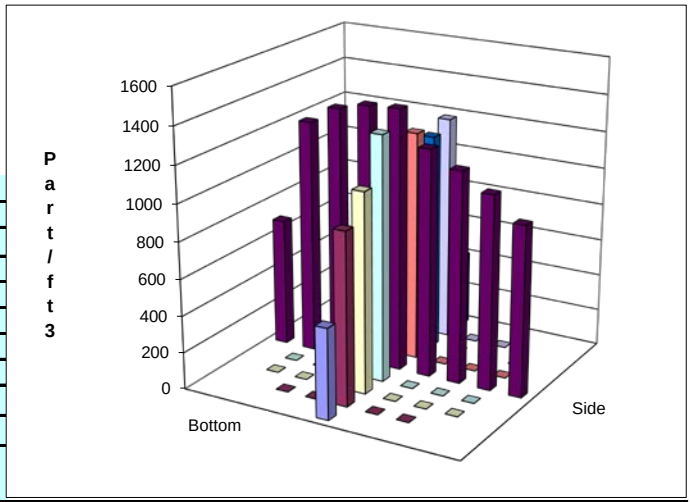
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	1077.7		Mean	1271.1	1146.5	1208.8	1236.68
Min Point	383.0	-64.5%	Std. Dev.	136.8	151.0	152.7	146.54
Max Point	1416.3	31.4%	COV as %	10.8	13.2	**12.6**	**11.85**

Avg Conc 1039 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
N/A			

	Start	Finish	
Generator Inlet Press	2.8	2.8	psig
Stack Temp	50	53.1	F
Mean Velocity	3239	3235	afpm
Ambient pressure	29.79	29.78	inHg
Ambient humidity	39.1%	41.6%	RH
Ambient temp	19.9	19.1	C
Back-Gd aerosol	0, 3, 1, 1, 4	1, 0, 1, 0, 2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	38	47	psig



Notes: Ambient temp measured inside tent.
Velocity measured at Test Port 1, side, center.
Fan B damper open 70°, Fan A damper closed.

EA 11.25.14

Oil Used: Edwards
Ref. Probe Location: Ref port
Probe Type / Configuration: L-Shape probe

Entries made by: Ernest Antonio
Signature/date 11/25/2014
Signature on file with Original

Technical Data Review performed by: Carmen Arimescu
Signature/date 2/24/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-19**
Date	11/26/2014	Fan configuration	**B- Max**
Tester	EA & JAG	Fan Setting	**55** **Hz**
Stack Dia.	11.922 in.	Stack Temp	64.1 deg F
Stack X-Area	111.6 in.2	Start/End Time	0940 - 1130
Test Port	1D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	131.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I2**
		Damper Configuration	**scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	902	936	1029	955.7	1056	1165	1137	1119.3
2 1.25	998	1075	1096	1056.3	1439	1450	1539	1476.0
3 2.31	1112	1150	1156	1139.3	1486	1476	1568	1510.0
4 3.85	1223	1236	1222	1227.0	1532	1598	1573	1567.7
Center 5.96	1350	1373	1335	1352.7	1501	1490	1582	1524.3
5 8.07	1345	1303	1406	1351.3	1174	1090	1134	1132.7
6 9.61	1352	1216	1206	1258.0	845	867	921	877.7
7 10.67	1114	1129	1123	1122.0	733	633	870	745.3
8 11.42	735	715	787	745.7	455	471	164	363.3
Averages ---------->	1125.7	1125.9	1151.1	1134.2	1135.7	1137.8	1165.3	1146.3

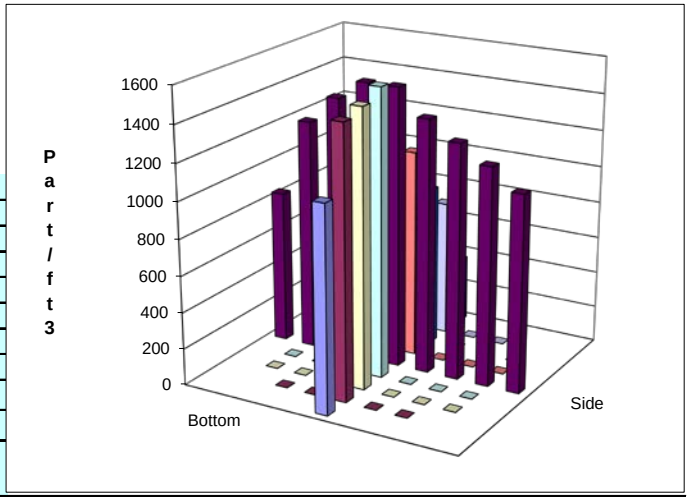
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	1140.2		Mean	1215.2	1262.0	1238.6	1315.71
Min Point	363.3	-68.1%	Std. Dev.	114.8	341.8	246.1	254.47
Max Point	1567.7	37.5%	COV as %	9.4	27.1	**19.9**	**19.34**

Avg Conc 1103 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	2.8	2.8	psig
Stack Temp	63.4	64.8	F
Mean Velocity	3164	3021	afpm
Ambient pressure	29.78	29.73	inHg
Ambient humidity	42.5%	39.7%	RH
Ambient temp	64	67	F
Back-Gd aerosol	3, 4, 3, 0, 4	2, 2, 3, 3, 2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	38	48	psig



Notes: Velocity and Temp at Side Center

11/26/2014

JAG

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: JA Glissmeyer
Signature/date 11/26/2014
Signature on file with Original

Technical Data Review performed by: Carmen Arimescu
Signature/date 2/24/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-20**
Date	12/1/2014	Fan configuration	**Fan B max**
Tester	CA, EA	Fan Setting	**55** **Hz**
Stack Dia.	11.922 in.	Stack Temp	61.3 deg F
Stack X-Area	111.6 in.2	Start/End Time	1300/245
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I3
		Damper Configuration	**scale**

Order ----->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	174	227	216	205.7	476	524	417	472.3
2	1.25	217	293	277	262.3	599	578	585	587.3
3	2.31	324	306	319	316.3	704	603	668	658.3
4	3.85	439	421	390	416.7	726	732	704	720.7
Center	5.96	486	484	471	480.3	850	881	850	860.3
5	8.07	518	457	457	477.3	918	906	843	889.0
6	9.61	466	505	492	487.7	952	930	863	915.0
7	10.67	494	459	436	463.0	787	776	731	764.7
8	11.42	452	416	431	433.0	726	716	682	708.0
Averages ---------->		396.7	396.4	387.7	393.6	748.7	738.4	704.8	730.6

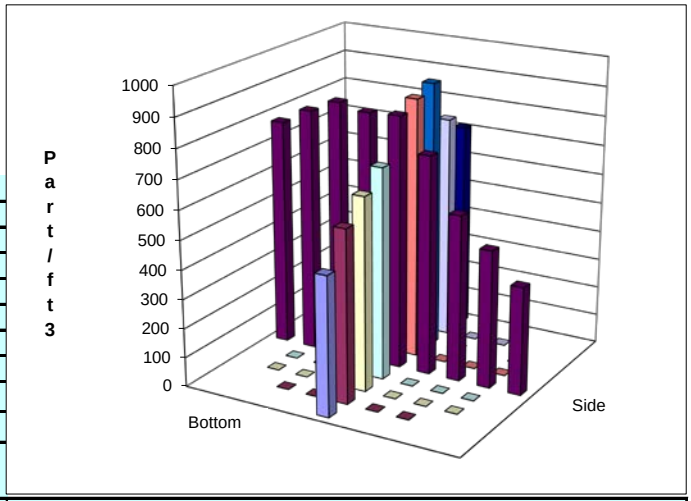
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	562.1		Mean	414.8	770.8	592.8	756.87
Min Point	205.7	-63.4%	Std. Dev.	90.2	123.6	211.9	138.91
Max Point	915.0	62.8%	COV as %	21.7	16.0	**35.8**	**18.35**

Avg Conc 549 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	2.8	2.8	psig
Stack Temp	61.4	61.2	F
Mean Velocity	3151	2946	afpm
Ambient pressure	29.8	29.8	inHg
Ambient humidity	21.5%	21.5%	RH
Ambient temp	53.6	55.4	F
Back-Gd aerosol	5,5,6,3,3	3,3,1,0,1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	48	psig



Notes:

CA 12/1/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: CA 12/1/2014
Signature/date
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-21**
Date	12/1/2014	Fan configuration	**Fan B max**
Tester	CA, EA	Fan Setting	**55** **Hz**
Stack Dia.	11.922 in.	Stack Temp	60.4 deg F
Stack X-Area	111.6 in.2	Start/End Time	255/415
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I3
		Damper Configuration	**scale**

Order ----->		1st				2nd				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	particles/ft3				particles/ft3				
1	0.50	496	444	467	469.0	551	476	568	531.7	
2	1.25	473	429	517	473.0	603	603	641	615.7	
3	2.31	592	573	595	586.7	618	657	661	645.3	
4	3.85	672	639	655	655.3	753	780	731	754.7	
Center	5.96	758	793	754	768.3	760	828	866	818.0	
5	8.07	742	761	802	768.3	858	853	895	868.7	
6	9.61	772	778	822	790.7	890	838	867	865.0	
7	10.67	750	795	747	764.0	818	826	842	828.7	
8	11.42	692	626	697	671.7	660	655	587	634.0	
Averages ---------->		660.8	648.7	672.9	660.8	723.4	724.0	739.8	729.1	

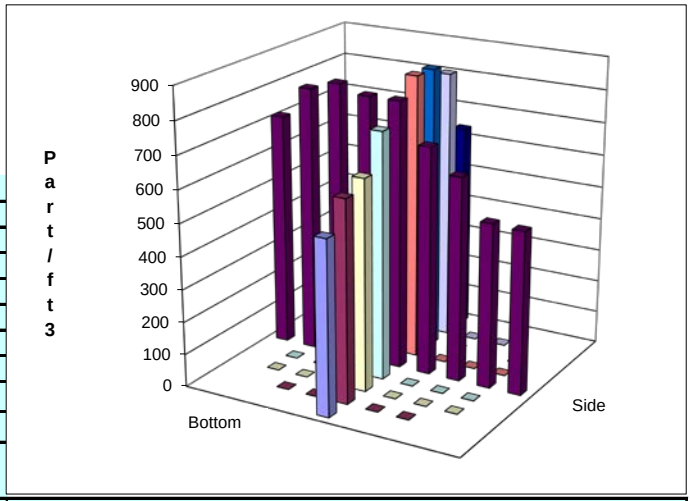
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	694.9		Mean	686.6	770.9	728.7	750.93
Min Point	469.0	-32.5%	Std. Dev.	120.3	103.4	116.3	113.68
Max Point	868.7	25.0%	COV as %	17.5	13.4	**16.0**	**15.14**

Avg Conc 683 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	2.8	2.8	psig
Stack Temp	61.2	59.6	F
Mean Velocity	2946	2912	afpm
Ambient pressure	29.8	29.8	inHg
Ambient humidity	21.5%	23.1%	RH
Ambient temp	55.4	53	F
Back-Gd aerosol	3,3,1,0,1	4,6,10,4,2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	49	psig



Notes:

CA 12/1/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by:	CA 12/1/2014	Technical Data Review performed by:	Julia Flaherty
Signature/date		Signature/date	5/5/2015
	Signature on file with original		Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-22**
Date	12/2/2014	Fan configuration	**Fan B max**
Tester	CA,EA	Fan Setting	**55** **Hz**
Stack Dia.	11.922 in.	Stack Temp	61.65 deg F
Stack X-Area	111.6 in.2	Start/End Time	1045/1215
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I3
		Damper Configuration	**scale**

Order ----->		2nd				1st				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	particles/ft3				particles/ft3				
1	0.50	308	401	439	382.7	312	291	277	293.3	
2	1.25	410	489	464	454.3	462	431	378	423.7	
3	2.31	486	508	590	528.0	558	511	516	528.3	
4	3.85	627	629	659	638.3	656	623	596	625.0	
Center	5.96	632	753	704	696.3	743	661	711	705.0	
5	8.07	724	755	786	755.0	756	793	801	783.3	
6	9.61	791	769	810	790.0	801	817	764	794.0	
7	10.67	750	798	837	795.0	742	725	702	723.0	
8	11.42	684	730	767	727.0	582	636	565	594.3	
Averages ---------->		601.3	648.0	672.9	640.7	623.6	609.8	590.0	607.8	

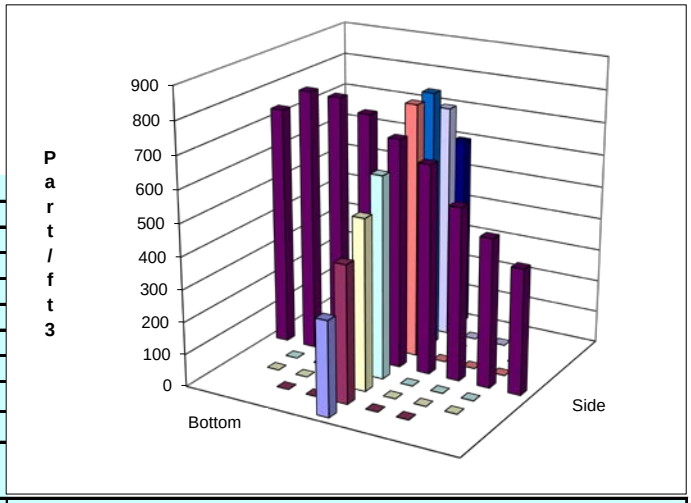
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	624.3		Mean	665.3	654.6	660.0	664.09
Min Point	293.3	-53.0%	Std. Dev.	132.6	137.5	129.9	130.90
Max Point	795.0	27.4%	COV as %	19.9	21.0	**19.7**	**19.71**

Avg Conc 615 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	2.8	2.8	psig
Stack Temp	59.9	63.4	F
Mean Velocity	2996	2990	afpm
Ambient pressure	29.9	29.9	inHg
Ambient humidity	28.1%	23.9%	RH
Ambient temp	50	53.6	F
Back-Gd aerosol	7,6,3,4,4	4,2,1,4,2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	49	48	psig



Notes:

CA 12/2/2014

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: CA 12/2/2014
Signature/date
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-23**
Date	12/2/2014	Fan configuration	**Fan B max**
Tester	CA,EA	Fan Setting	**55** **Hz**
Stack Dia.	11.922 in.	Stack Temp	63.935 deg F
Stack X-Area	111.6 in.2	Start/End Time	1222/1355
Test Port	1D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	131.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I3
		Damper Configuration	**scale**

Order ----->		1st				2nd				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	particles/ft3				particles/ft3				
1	0.50	287	253	298	279.3	505	546	514	521.7	
2	1.25	392	388	355	378.3	639	656	637	644.0	
3	2.31	517	527	481	508.3	730	684	716	710.0	
4	3.85	693	723	612	676.0	846	790	769	801.7	
Center	5.96	812	801	795	802.7	882	870	841	864.3	
5	8.07	857	861	878	865.3	796	836	810	814.0	
6	9.61	1015	913	889	939.0	726	723	816	755.0	
7	10.67	932	972	909	937.7	622	696	715	677.7	
8	11.42	801	706	678	728.3	318	117	506	313.7	
Averages ---------->		700.7	682.7	655.0	679.4	673.8	657.6	702.7	678.0	

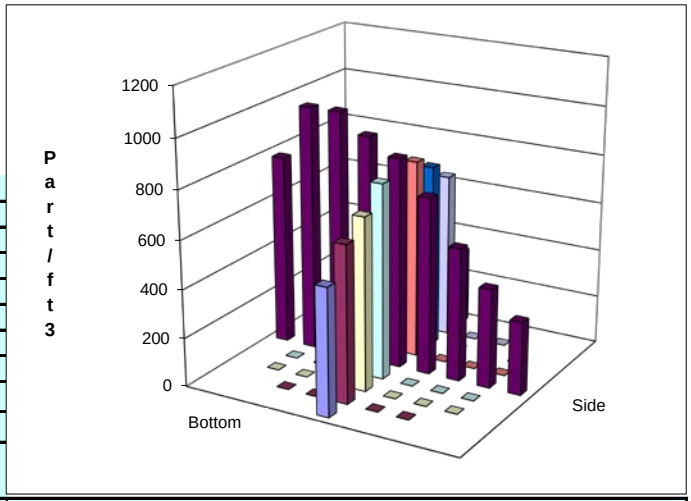
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	678.7		Mean	729.6	752.4	741.0	769.03
Min Point	279.3	-58.8%	Std. Dev.	218.4	79.5	158.3	169.51
Max Point	939.0	38.3%	COV as %	29.9	10.6	**21.4**	**22.04**

Avg Conc 659 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	2.8	2.8	psig
Stack Temp	63.47	64.4	F
Mean Velocity	3020	2935	afpm
Ambient pressure	29.8	29.8	inHg
Ambient humidity	26.0%	28.6%	RH
Ambient temp	51.8	50	F
Back-Gd aerosol	4,0,2,1,2	5,2,1,3,3	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	47	48	psig



Notes: velocity was measured at Port1
side,center

CA 12/2/2014

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: CA 12/2/2014
Signature/date
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
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PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-24**
Date	12/3/2014	Fan configuration	**Fan B max**
Tester	CA,EA	Fan Setting	**57.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	59.15 deg F
Stack X-Area	111.6 in.2	Start/End Time	955/1120
Test Port	1D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	131.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I3
		Damper Configuration	**scale**

Order ----->	2nd				1st			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	502	549	528	526.3	677	679	707	687.7
2 1.25	616	581	593	596.7	761	755	817	777.7
3 2.31	712	690	659	687.0	764	797	794	785.0
4 3.85	728	739	751	739.3	786	851	851	829.3
Center 5.96	839	833	823	831.7	792	912	918	874.0
5 8.07	910	913	812	878.3	874	835	900	869.7
6 9.61	900	866	827	864.3	730	817	771	772.7
7 10.67	863	841	759	821.0	582	676	712	656.7
8 11.42	385	334	354	357.7	408	499	463	456.7
Averages ---------->	717.2	705.1	678.4	700.3	708.2	757.9	770.3	745.5

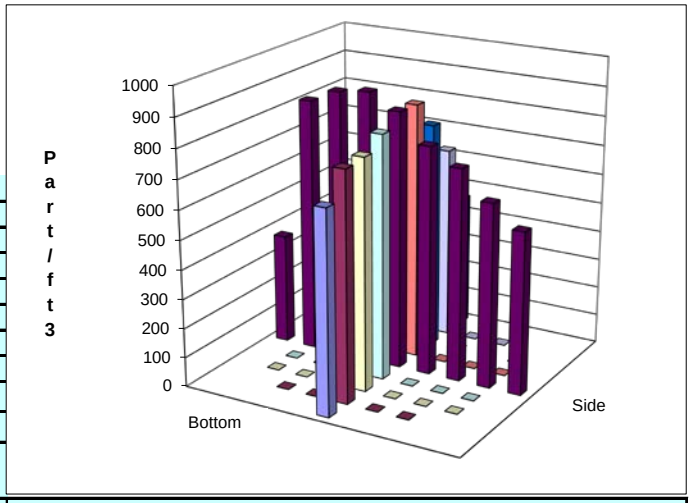
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	722.9		Mean	774.0	795.0	784.5	804.22
Min Point	357.7	-50.5%	Std. Dev.	103.9	74.2	87.4	90.21
Max Point	878.3	21.5%	COV as %	13.4	9.3	**11.1**	**11.22**

Avg Conc 707 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	58.2	60.1	F
Mean Velocity	3034	3036	afpm
Ambient pressure	29.6	29.6	inHg
Ambient humidity	26.8%	31.2%	RH
Ambient temp	50.0	50.0	F
Back-Gd aerosol	8,8,3,12,4	3,2,3,0,2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	46	48	psig



Notes: velocity was measured at Port1
side,center

CA 12/3/2014

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: CA 12/3/2014
Signature/date
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-25**
Date	12/3/2014	Fan configuration	**Fan B max**
Tester	CA,EA	Fan Setting	**57.5** **Hz**
Stack Dia.	11.922 in.	Stack Temp	60.35 deg F
Stack X-Area	111.6 in.2	Start/End Time	1123/1237
Test Port	1D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	131.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I3
		Damper Configuration	**scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	560	460	462	494.0	421	503	494	472.7
2 1.25	660	552	571	594.3	657	649	652	652.7
3 2.31	696	688	669	684.3	822	731	672	741.7
4 3.85	729	726	719	724.7	778	808	855	813.7
Center 5.96	799	876	788	821.0	840	880	935	885.0
5 8.07	886	920	906	904.0	899	895	895	896.3
6 9.61	975	905	916	932.0	816	828	873	839.0
7 10.67	854	896	838	862.7	640	713	766	706.3
8 11.42	409	386	320	371.7	370	323	327	340.0
Averages ---------->	729.8	712.1	687.7	709.9	693.7	703.3	718.8	705.3

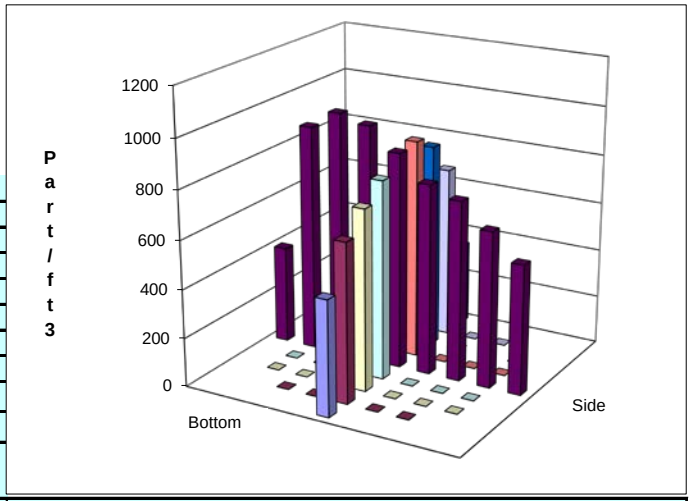
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	707.6		Mean	789.0	790.7	789.8	820.59
Min Point	340.0	-51.9%	Std. Dev.	124.6	92.6	105.5	115.10
Max Point	932.0	31.7%	COV as %	15.8	11.7	**13.4**	**14.03**

Avg Conc 689 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	60.1	60.6	F
Mean Velocity	3036	3164	afpm
Ambient pressure	29.6	29.6	inHg
Ambient humidity	31.2%	32.0%	RH
Ambient temp	50.0	50.0	F
Back-Gd aerosol	3,2,3,0,2	2,4,1,2,3	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	46	psig



Notes: velocity was measured at Port1
side,center

CA 12/3/2014

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: CA 12/3/2014
Signature/date
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-26**
Date	12/4/2014	Fan configuration	**B Max**
Tester	CA, EA	Fan Setting	**57.7** **Hz**
Stack Dia.	11.922 in.	Stack Temp	64.35 deg F
Stack X-Area	111.6 in.2	Start/End Time	1028 / 1200
Test Port	2D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	143.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->	2nd				1st			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	557	557	587	567.0	435	434	556	475.0
2 1.25	734	644	773	717.0	677	742	789	736.0
3 2.31	782	768	751	767.0	750	854	872	825.3
4 3.85	826	852	881	853.0	797	887	917	867.0
Center 5.96	926	884	848	886.0	892	943	939	924.7
5 8.07	952	920	909	927.0	833	929	933	898.3
6 9.61	922	856	894	890.7	726	760	825	770.3
7 10.67	788	705	758	750.3	640	618	607	621.7
8 11.42	474	416	412	434.0	480	523	527	510.0
Averages ---------->	773.4	733.6	757.0	754.7	692.2	743.3	773.9	736.5

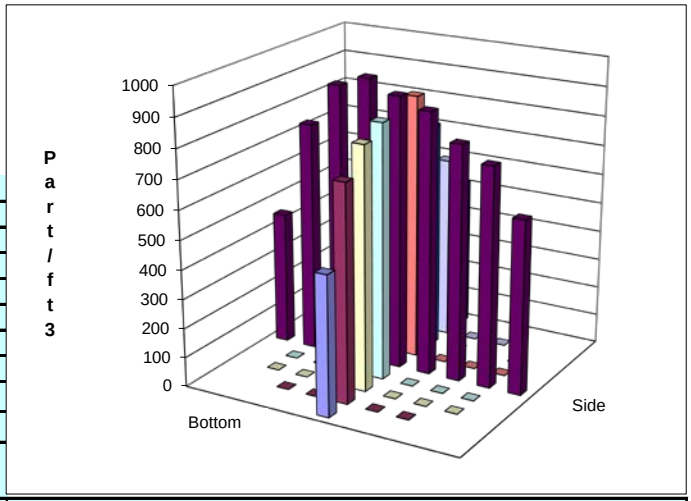
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	745.6		Mean	827.3	806.2	816.7	834.79
Min Point	434.0	-41.8%	Std. Dev.	81.4	105.6	91.2	96.73
Max Point	927.0	24.3%	COV as %	9.8	13.1	**11.2**	**11.59**

Avg Conc 726 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	64.4	64.3	F
Mean Velocity	3224	3242	afpm
Ambient pressure	29.6	29.6	inHg
Ambient humidity	33.7%	36.4%	RH
Ambient temp	57.2	55.4	F
Back-Gd aerosol	1, 2, 2, 2, 3	1, 8, 5, 7, 2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	46	48	psig



Notes: When we tested on the side, the OPC was outside from the platform.

CA 12/4/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 12/4/2014
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-27**
Date	12/4/2014	Fan configuration	**Fan B Max**
Tester	CA, EA	Fan Setting	**57.7** **Hz**
Stack Dia.	11.922 in.	Stack Temp	64.4 deg F
Stack X-Area	111.6 in.2	Start/End Time	1205 / 1320
Test Port	2D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	143.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I3
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	636	543	672	617.0	484	563	533	526.7
2 1.25	635	631	708	658.0	682	856	858	798.7
3 2.31	721	743	789	751.0	824	963	920	902.3
4 3.85	857	836	848	847.0	883	1003	1015	967.0
Center 5.96	941	905	881	909.0	1019	958	1063	1013.3
5 8.07	976	968	1008	984.0	968	947	952	955.7
6 9.61	956	1052	1042	1016.7	815	849	854	839.3
7 10.67	830	811	844	828.3	670	726	698	698.0
8 11.42	566	557	520	547.7	523	529	537	529.7
Averages ---------->	790.9	782.9	812.4	795.4	763.1	821.6	825.6	803.4

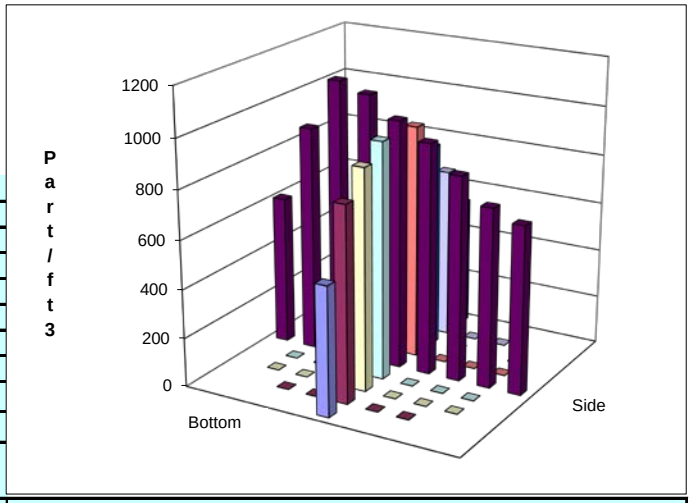
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	799.4		Mean	856.3	882.0	869.2	918.31
Min Point	526.7	-34.1%	Std. Dev.	126.5	110.3	114.8	127.32
Max Point	1016.7	27.2%	COV as %	14.8	12.5	**13.2**	**13.86**

Avg Conc 779 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	64.3	64.5	F
Mean Velocity	3242	3112	afpm
Ambient pressure	29.6	29.6	inHg
Ambient humidity	36.4%	41.5%	RH
Ambient temp	55.4	55.4	F
Back-Gd aerosol	1, 8, 5, 7, 2	1, 4, 4, 2, 1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	48	psig



Notes:

CA 12/4/14

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by:	Carmen Arimescu	Technical Data Review performed by:	Julia Flaherty
Signature/date	12/4/2014	Signature/date	5/5/2015
	Signature on file with original		Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-28**
Date	12/4/2014	Fan configuration	**Fan B Max**
Tester	CA, EA	Fan Setting	**57.7** **Hz**
Stack Dia.	11.922 in.	Stack Temp	64.35 deg F
Stack X-Area	111.6 in.2	Start/End Time	1326 / 1445
Test Port	2D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	143.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I3
		Damper Configuration	**Scale**

Order ----->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	635	612	611	619.3	596	504	506	535.3
2	1.25	829	671	731	743.7	864	851	758	824.3
3	2.31	808	755	762	775.0	904	800	883	862.3
4	3.85	934	868	860	887.3	947	915	971	944.3
Center	5.96	1001	993	1039	1011.0	1036	1001	954	997.0
5	8.07	1104	984	1014	1034.0	1025	944	921	963.3
6	9.61	1113	1062	1056	1077.0	882	879	859	873.3
7	10.67	774	763	855	797.3	715	737	709	720.3
8	11.42	589	537	533	553.0	553	557	607	572.3
Averages ---------->		865.2	805.0	829.0	833.1	835.8	798.7	796.4	810.3

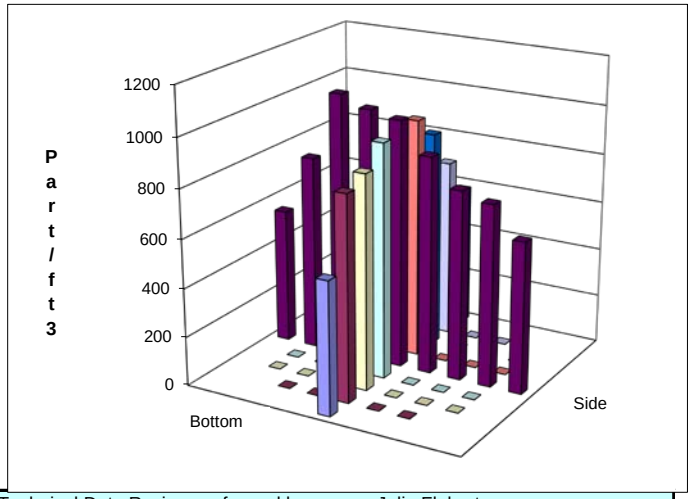
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	821.7		Mean	903.6	883.6	893.6	899.80
Min Point	535.3	-34.8%	Std. Dev.	136.8	94.5	113.4	113.56
Max Point	1077.0	31.1%	COV as %	15.1	10.7	**12.7**	**12.62**

Avg Conc 799 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	64.5	64.2	F
Mean Velocity	3112	3029	afpm
Ambient pressure	29.6	29.6	inHg
Ambient humidity	41.5%	38.4%	RH
Ambient temp	55.4	55.4	F
Back-Gd aerosol	1, 4, 4, 2, 1	0, 4, 1, 1, 2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	48	psig



Notes:

CA 12/4/2014

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 12/4/2014
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-29**
Date	12/5/2014	Fan configuration	**Fan B**
Tester	CA, EA	Fan Setting	**57.7** **Hz**
Stack Dia.	11.922 in.	Stack Temp	64.2 deg F
Stack X-Area	111.6 in.2	Start/End Time	0843 / 1000
Test Port	2D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	143.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	407	675	610	564.0	860	943	867	890.0
2 1.25	589	810	881	760.0	1315	1333	1316	1321.3
3 2.31	727	952	948	875.7	1403	1385	1389	1392.3
4 3.85	1017	1114	1166	1099.0	1505	1418	1407	1443.3
Center 5.96	1271	1285	1312	1289.3	1400	1415	1492	1435.7
5 8.07	1302	1353	1418	1357.7	1283	1326	1254	1287.7
6 9.61	1309	1363	1338	1336.7	1132	1166	1028	1108.7
7 10.67	1019	1120	1150	1096.3	903	899	963	921.7
8 11.42	722	733	763	739.3	666	643	711	673.3
Averages ---------->	929.2	1045.0	1065.1	1013.1	1163.0	1169.8	1158.6	1163.8

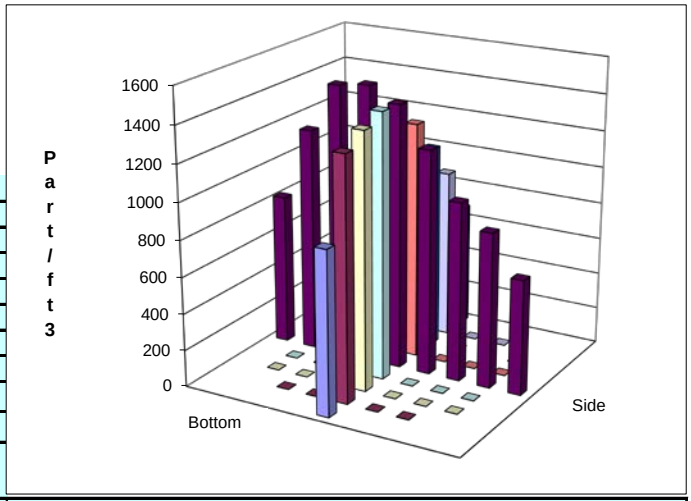
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	1088.4		Mean	1116.4	1273.0	1194.7	1258.02
Min Point	564.0	-48.2%	Std. Dev.	231.8	192.7	220.3	219.34
Max Point	1443.3	32.6%	COV as %	20.8	15.1	**18.4**	**17.44**

Avg Conc 1054 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	64.0	64.4	F
Mean Velocity	3099	3060	afpm
Ambient pressure	29.7	29.7	inHg
Ambient humidity	40.1%	44.0%	RH
Ambient temp	57.2	55.4	F
Back-Gd aerosol	0, 2, 2, 0, 0	2, 1, 2, 2, 3	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	40	48	psig



Notes:

CA 12/5/2014

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 12/5/2014
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-30**
Date	12/5/2014	Fan configuration	**Fan B Max**
Tester	CA, EA	Fan Setting	**57.7** **Hz**
Stack Dia.	11.922 in.	Stack Temp	64.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	1000 / 1122
Test Port	2D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	143.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	**Scale**

Order ----->				2nd					1st	
Traverse-->			Side					Bottom		
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	particles/ft3				particles/ft3				
1	0.50	803	903	902	869.3	942	860	918	906.7	
2	1.25	849	1078	1155	1027.3	1323	1215	1253	1263.7	
3	2.31	976	1160	1245	1127.0	1360	1386	1394	1380.0	
4	3.85	1212	1310	1371	1297.7	1498	1518	1505	1507.0	
Center	5.96	1374	1469	1529	1457.3	1464	1506	1497	1489.0	
5	8.07	1349	1463	1455	1422.3	1365	1284	1319	1322.7	
6	9.61	1415	1433	1461	1436.3	1201	1194	1193	1196.0	
7	10.67	1132	1150	1058	1113.3	934	1016	978	976.0	
8	11.42	755	780	787	774.0	721	812	749	760.7	
Averages ---------->		1096.1	1194.0	1218.1	1169.4	1200.9	1199.0	1200.7	1200.2	

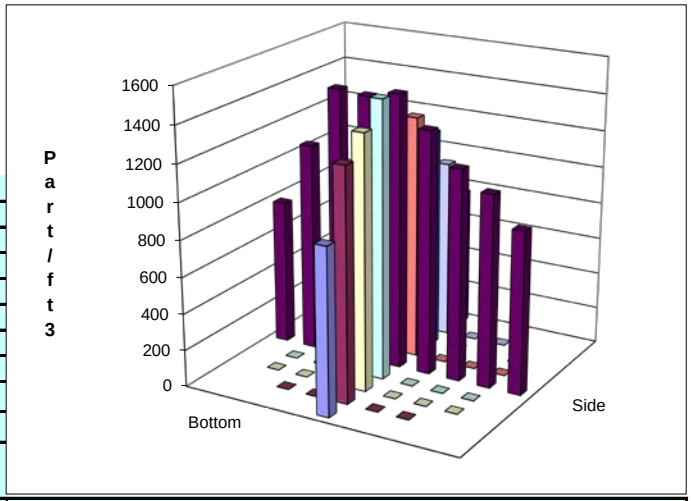
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	1184.8		Mean	1268.8	1304.9	1286.8	1300.62
Min Point	760.7	-35.8%	Std. Dev.	178.2	183.7	174.9	175.78
Max Point	1507.0	27.2%	COV as %	14.0	14.1	**13.6**	**13.51**

Avg Conc 1149 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	64.4	64.6	F
Mean Velocity	3060	3113	afpm
Ambient pressure	29.7	29.7	inHg
Ambient humidity	44.0%	43.1%	RH
Ambient temp	55.4	62.6	F
Back-Gd aerosol	2, 1, 2, 2, 3	1, 1, 3, 2, 1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	48	psig



Notes:

CA 12/5/2014

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 12/5/2014
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-31**
Date	12/5/2014	Fan configuration	**Fan B Max**
Tester	CA, EA	Fan Setting	**57.7** **Hz**
Stack Dia.	11.922 in.	Stack Temp	64.4 deg F
Stack X-Area	111.6 in.2	Start/End Time	1125 / 1240
Test Port	2D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	143.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I2
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	1000	1031	993	1008.0	535	551	529	538.3
2 1.25	1158	1113	1203	1158.0	1015	978	968	987.0
3 2.31	1261	1229	1177	1222.3	1172	1148	1169	1163.0
4 3.85	1321	1372	1358	1350.3	1310	1304	1288	1300.7
Center 5.96	1493	1484	1491	1489.3	1434	1483	1467	1461.3
5 8.07	1563	1469	1389	1473.7	1458	1383	1488	1443.0
6 9.61	1451	1483	1350	1428.0	1249	1317	1307	1291.0
7 10.67	1139	1085	1015	1079.7	1145	1206	1167	1172.7
8 11.42	748	623	699	690.0	1046	942	951	979.7
Averages ---------->	1237.1	1209.9	1186.1	1211.0	1151.6	1145.8	1148.2	1148.5

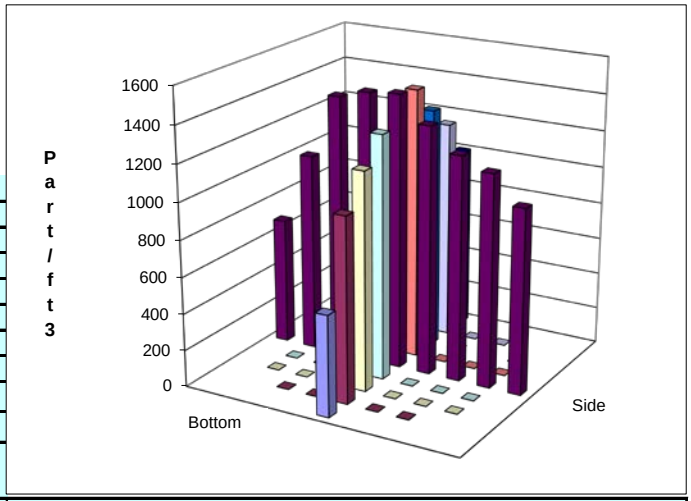
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	1179.8		Mean	1314.5	1259.8	1287.1	1299.21
Min Point	538.3	-54.4%	Std. Dev.	162.4	167.4	161.0	160.81
Max Point	1489.3	26.2%	COV as %	12.4	13.3	**12.5**	**12.38**

Avg Conc 1143 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	64.6	64.2	F
Mean Velocity	3113	3095	afpm
Ambient pressure	29.7	29.7	inHg
Ambient humidity	43.1%	40.0%	RH
Ambient temp	62.6	62.6	F
Back-Gd aerosol	1, 1, 3, 2, 1	1, 0, 1, 0, 1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	48	psig



Notes:

CA 12/5/2014

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 12/5/2014
Signature on file with original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-32**
Date	12/7/2014	Fan configuration	**Fan B Max**
Tester	EA, JEF	Fan Setting	**57.6** **Hz**
Stack Dia.	11.922 in.	Stack Temp	45 deg F
Stack X-Area	111.6 in.2	Start/End Time	0930 / 1105
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I5**
		Damper Configuration	**Scale**

Order ----->		2				1			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	555	624	651	610.0	562	432	464	486.0
2	1.25	630	757	763	716.7	691	697	598	662.0
3	2.31	743	825	896	821.3	810	816	803	809.7
4	3.85	910	997	1053	986.7	1005	933	1014	984.0
Center	5.96	1064	1106	1140	1103.3	1065	1108	1094	1089.0
5	8.07	1085	1176	1143	1134.7	1197	1138	1264	1199.7
6	9.61	1079	1143	1180	1134.0	1098	1154	1137	1129.7
7	10.67	1032	1100	1103	1078.3	1073	1118	1085	1092.0
8	11.42	1073	546	788	802.3	804	849	864	839.0
Averages ---------->		907.9	919.3	968.6	931.9	922.8	916.1	924.8	921.2

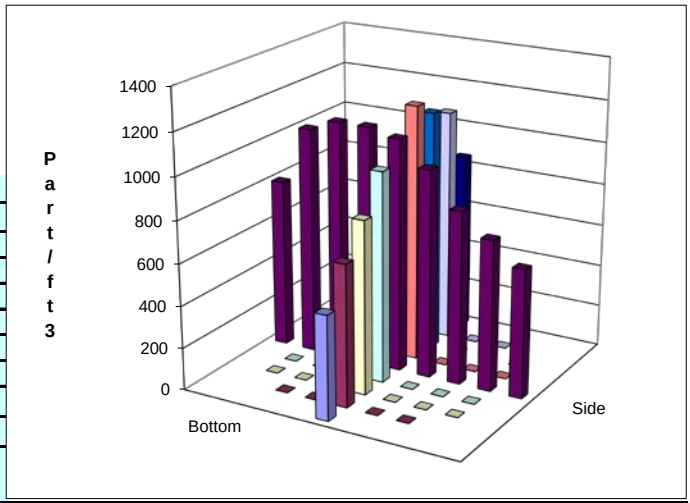
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	926.6		Mean	996.4	995.1	995.8	1002.33
Min Point	486.0	-47.5%	Std. Dev.	165.9	193.1	172.9	174.36
Max Point	1199.7	29.5%	COV as %	16.7	19.4	**17.4**	**17.40**

Avg Conc 905 pt/ft3

	Start	Finish	
Generator Inlet Press	4.6	4.6	psig
Stack Temp	42.9	47.1	F
Mean Velocity	3113	3028	afpm
Ambient pressure	29.8	29.8	inHg
Ambient humidity	48.1%	40.5%	RH
Ambient temp	13.7	15.9	C
Back-Gd aerosol	12, 2, 2, 0, 0	0, 2, 0, 0, 1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	48	psig

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			



Notes: No duct heater. Outside temp is ~ 40°F

Injection probe has a sharp 90° bend.

JEF

12/8/2014

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: Julia Flaherty
Signature/date 12/8/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 2/25/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	LV-C2 Remedial Stack Model	Run No.	PT-33
Date	12/7/2014	Fan configuration	B Max
Tester	JAG, EA	Fan Setting	58 Hz
Stack Dia.	11.922 in.	Stack Temp	48.55 deg F
Stack X-Area	111.6 in.2	Start/End Time	1417 / 1550
Test Port	1D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	131.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I5
		Damper Configuration	Scale

		Order ----->	1				2			
		Traverse-->	Side				Bottom			
		Trial ---->	1	2	3	Mean	1	2	3	Mean
Point	Depth, in.		particles/ft3				particles/ft3			
1	0.50		492	409	525	475.3	639	340	283	420.7
2	1.25		655	652	765	690.7	839	545	510	631.3
3	2.31		761	841	846	816.0	910	739	720	789.7
4	3.85		955	923	986	954.7	1154	1021	953	1042.7
Center	5.96		1149	1183	1184	1172.0	1324	1194	1201	1239.7
5	8.07		1265	1222	1325	1270.7	1305	1297	1271	1291.0
6	9.61		1287	1308	1365	1320.0	1280	1327	1347	1318.0
7	10.67		1260	1321	1285	1288.7	1073	1115	1146	1111.3
8	11.42		1107	990	1026	1041.0	340	450	499	429.7
Averages ---------->			992.3	983.2	1034.1	1003.2	984.9	892.0	881.1	919.3

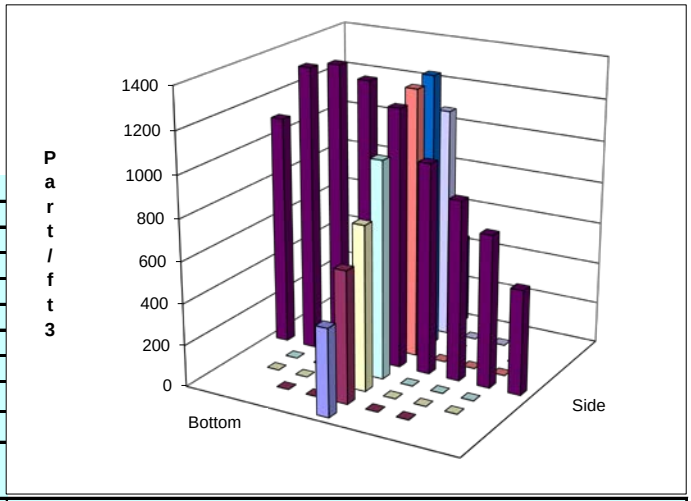
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	961.3		Mean	1073.2	1060.5	1066.9	1097.86
Min Point	420.7	-56.2%	Std. Dev.	252.5	262.0	247.3	257.14
Max Point	1320.0	37.3%	COV as %	23.5	24.7	**23.2**	**23.42**

Avg Conc 931 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	4.5	4.6	psig
Stack Temp	49.2	47.9	F
Mean Velocity	3043	3007	afpm
Ambient pressure	29.7	29.7	inHg
Ambient humidity	38.5%	49.9%	RH
Ambient temp	19	15.6	C
Back-Gd aerosol	0, 1, 0, 2, 1	0, 0, 0, 1, 1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	46	48	psig



Notes:

JAG
12/8/2014

Oil Used: Edwards 19

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: J Glissmeyer
Signature/date 12/8/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 2/25/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-34**
Date	12/9/2014	Fan configuration	**Fan B Max**
Tester	EA, JEF	Fan Setting	**58** **Hz**
Stack Dia.	11.922 in.	Stack Temp	44 deg F
Stack X-Area	111.6 in.2	Start/End Time	0905 / 1045
Test Port	1D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	131.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I5**
		Damper Configuration	**Scale**

Order ----->		2nd				1st				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	particles/ft3				particles/ft3				
1	0.50	607	347	364	439.3	644	251	254	383.0	
2	1.25	827	597	664	696.0	867	505	477	616.3	
3	2.31	922	764	832	839.3	944	664	625	744.3	
4	3.85	1073	911	1013	999.0	1095	920	885	966.7	
Center	5.96	1055	1161	1136	1117.3	1283	1055	1068	1135.3	
5	8.07	1141	1318	1299	1252.7	1246	1202	1125	1191.0	
6	9.61	1174	1323	1331	1276.0	1203	1127	1079	1136.3	
7	10.67	1033	1222	1299	1184.7	1095	1051	1079	1075.0	
8	11.42	445	1031	860	778.7	787	818	794	799.7	
Averages ---------->		919.7	963.8	977.6	953.7	1018.2	843.7	820.7	894.2	

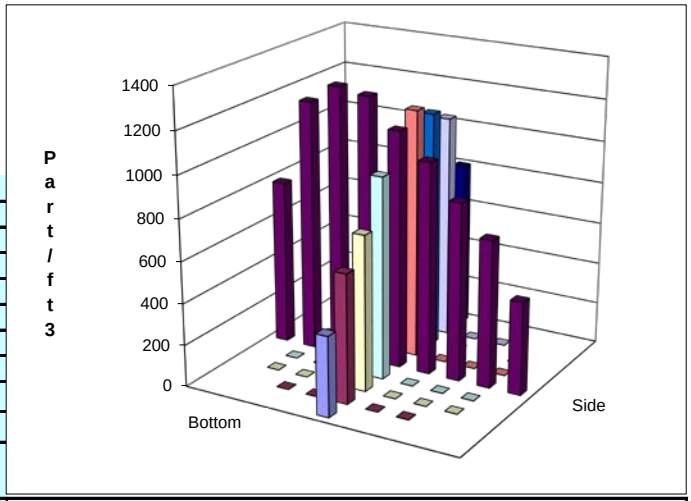
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	923.9		Mean	1052.1	980.7	1016.4	1024.90
Min Point	383.0	-58.5%	Std. Dev.	218.7	219.9	213.9	217.30
Max Point	1276.0	38.1%	COV as %	20.8	22.4	**21.0**	**21.20**

Avg Conc 899 pt/ft3

Instuments Used: Cal. Due

TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	4.6	4.5	psig
Stack Temp	42.8	45.2	F
Mean Velocity	3092	3229	afpm
Ambient pressure	29.6	29.6	inHg
Ambient humidity	50.6%	49.2%	RH
Ambient temp	14.4	15.5	C
Back-Gd aerosol	10, 4, 4, 2, 3	4, 0, 0, 2, 2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	40	48	psig



Notes: Dreary morning, sprinkling rain.
Injection probe has sharp 90o bend at tip. (Same as PT-32, PT-33)

JEF 12/9/14

Oil Used: Edwards 19

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: Ernest Antonio
Signature/date 12/9/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 2/25/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	LV-C2 Remedial Stack Model	Run No.	PT-35
Date	12/9/2014	Fan configuration	Fan B Max
Tester	EA, JEF	Fan Setting	58 Hz
Stack Dia.	11.922 in.	Stack Temp	45.85 deg F
Stack X-Area	111.6 in.2	Start/End Time	1045 / 1215
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	I5
		Damper Configuration	Scale

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	839	638	658	711.7	791	748	803	780.7
2 1.25	837	773	866	825.3	977	903	980	953.3
3 2.31	1027	921	966	971.3	1118	1083	1027	1076.0
4 3.85	1149	1112	1069	1110.0	1215	1210	1146	1190.3
Center 5.96	1282	1207	1254	1247.7	1336	1302	1217	1285.0
5 8.07	1199	1360	1274	1277.7	1393	1365	1323	1360.3
6 9.61	1242	1286	1282	1270.0	1392	1341	1181	1304.7
7 10.67	1145	1348	1286	1259.7	1307	1201	1110	1206.0
8 11.42	862	888	999	916.3	898	790	763	817.0
Averages ---------->	1064.7	1059.2	1072.7	1065.5	1158.6	1104.8	1061.1	1108.1

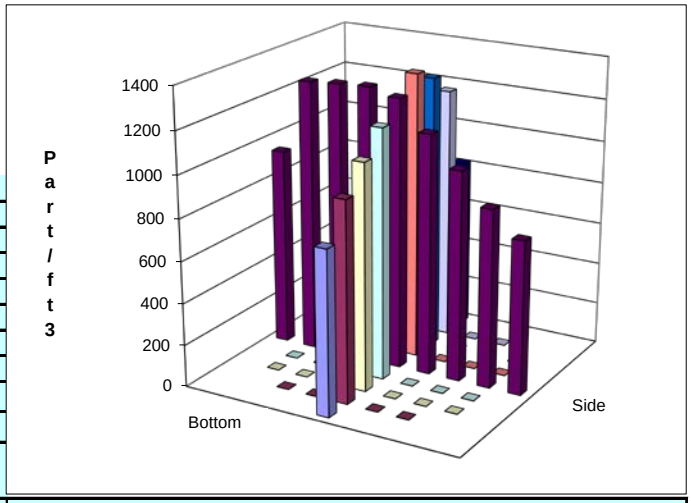
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	1086.8		Mean	1137.4	1196.5	1167.0	1183.97
Min Point	711.7	-34.5%	Std. Dev.	178.0	141.5	157.5	157.87
Max Point	1360.3	25.2%	COV as %	15.6	11.8	**13.5**	**13.33**

Avg Conc 1064 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	4.5	4.5	psig
Stack Temp	45.2	46.5	F
Mean Velocity	3229	3039	afpm
Ambient pressure	29.6	29.6	inHg
Ambient humidity	49.2%	41.2%	RH
Ambient temp	15.5	17.3	C
Back-Gd aerosol	4, 0, 0, 2, 2	0, 0, 2, 1, 0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	48	psig



Notes: Start conditions are finish conditions from PT-34

Not as drizzly as prev test, but still a dreary day

JEF 12/9/14

Oil Used: Edwards 19

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: Ernest Antonio
Signature/date 12/9/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 2/25/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-36**
Date	12/10/2014	Fan configuration	**B Max**
Tester	JAG, EA	Fan Setting	**58** **Hz**
Stack Dia.	11.922 in.	Stack Temp	44.4 deg F
Stack X-Area	111.6 in.2	Start/End Time	0930 / 1100
Test Port	1D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	131.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I5**
		Damper Configuration	**Scale**

Order ----->	2nd				1st			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 / 0.50	628	658	567	617.7	137	306	259	234.0
2 / 1.25	742	726	719	729.0	503	574	510	529.0
3 / 2.31	816	819	780	805.0	991	740	695	808.7
4 / 3.85	898	877	834	869.7	1066	969	906	980.3
Center / 5.96	925	939	870	911.3	1198	1080	1061	1113.0
5 / 8.07	954	909	815	892.7	1181	1157	1154	1164.0
6 / 9.61	881	790	772	814.3	1059	1099	1071	1076.3
7 / 10.67	805	730	621	718.7	942	949	973	954.7
8 / 11.42	468	447	408	441.0	781	740	649	723.3
Averages ---------->	790.8	766.1	709.6	755.5	873.1	846.0	808.7	842.6

All	pt/ft3	Dev. from mean
Mean	799.0	
Min Point	234.0	-70.7%
Max Point	1164.0	45.7%

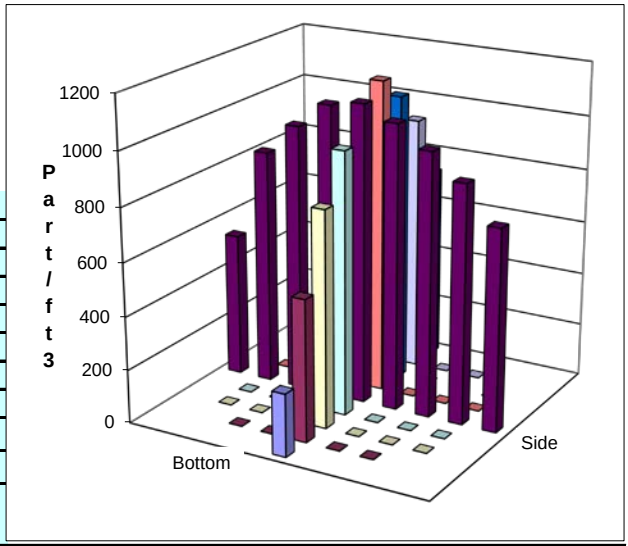
Center 2/3	Side	Bottom	All	Normlzd
Mean	820.1	946.6	883.3	974.07
Std. Dev.	76.3	218.5	170.4	163.86
COV as %	9.3	23.1	**19.3**	**16.82**

Avg Conc 772 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/E	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	4.5	4.5	psig
Stack Temp	43.7	45.1	F
Mean Velocity	3050	3088	afpm
Ambient pressure	29.3	29.24	inHg
Ambient humidity	47%	43%	RH
Ambient temp	15.8	17.5	C
Back-Gd aerosol	2, 1, 3, 0, 1	3, 0, 0, 1, 1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	50	50	psig



Notes:

JAG

12/10/2014

Oil Used: Edwards 19

Ref. Probe Location: Ref port 5D

Probe Type / Configuration: L-Shape probe

Entries made by: J Glissmeyer
Signature/date 12/10/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 2/25/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-37**
Date	12/10/2014	Fan configuration	**B Max**
Tester	EA, JAG	Fan Setting	**58** **Hz**
Stack Dia.	11.922 in.	Stack Temp	47.45 deg F
Stack X-Area	111.6 in.2	Start/End Time	1354 / 1525
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I5**
		Damper Configuration	**Scale**

Order ----->			1st				2nd			
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	731	777	821	776.3	728	601	576	635.0
2	1.25	836	918	908	887.3	850	887	826	854.3
3	2.31	996	980	1001	992.3	1015	970	977	987.3
4	3.85	1279	1269	1153	1233.7	1257	1184	1174	1205.0
Center	5.96	1358	1258	1323	1313.0	1384	1407	1410	1400.3
5	8.07	1288	1349	1312	1316.3	1474	1533	1475	1494.0
6	9.61	1389	1305	1230	1308.0	1367	1472	1435	1424.7
7	10.67	1329	1246	1184	1253.0	1342	1313	1298	1317.7
8	11.42	1078	1172	1025	1091.7	1011	940	978	976.3
Averages ---------->		1142.7	1141.6	1106.3	1130.2	1158.7	1145.2	1127.7	1143.9

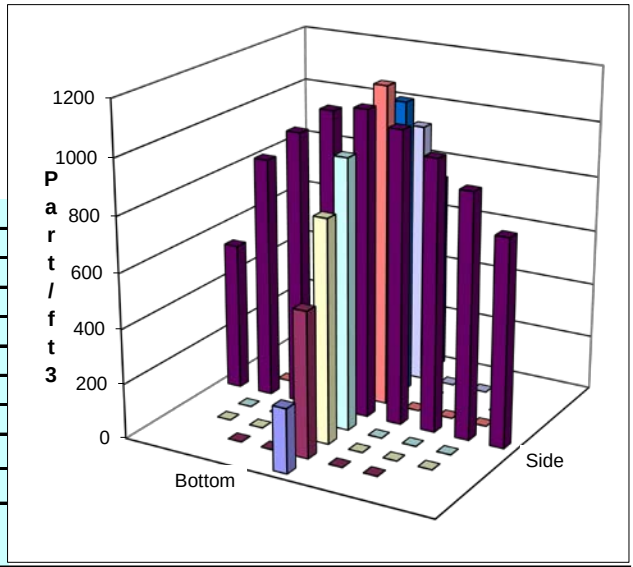
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	1137.0		Mean	1186.2	1240.5	1213.4	1252.81
Min Point	635.0	-44.2%	Std. Dev.	173.9	239.5	203.0	206.19
Max Point	1494.0	31.4%	COV as %	14.7	19.3	**16.7**	**16.46**

Avg Conc 1110 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Thern	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	4.5	4.6	psig
Stack Temp	47.5	47.4	F
Mean Velocity	3031	3085	afpm
Ambient pressure	29.12	29.03	inHg
Ambient humidity	41.8%	43.4%	RH
Ambient temp	19.4	18.4	C
Back-Gd aerosol	3, 4, 0, 3, 2	1, 3, 3, 1, 5	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	49	49	psig



Notes:

JAG

12/10/2014

Oil Used: Edwards 19

Ref. Probe Location: Ref port 5D

Probe Type / Configuration: L-Shape probe

Entries made by: J Glissmeyer
Signature/date 12/10/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 3/9/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-38**
Date	12/11/2014	Fan configuration	**B Max**
Tester	JAG, EA	Fan Setting	**58** **Hz**
Stack Dia.	11.922 in.	Stack Temp	49.15 deg F
Stack X-Area	111.6 in.2	Start/End Time	1025 / 1150
Test Port	1D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	131.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->									
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	829	895	866	863.3	743	566	547	618.7
2	1.25	988	947	870	935.0	719	600	655	658.0
3	2.31	996	957	1108	1020.3	727	739	730	732.0
4	3.85	1056	1024	1082	1054.0	793	842	835	823.3
Center	5.96	1120	1116	1111	1115.7	895	947	988	943.3
5	8.07	1007	1031	1025	1021.0	896	973	962	943.7
6	9.61	856	880	885	873.7	932	1015	1092	1013.0
7	10.67	748	757	776	760.3	831	1035	1026	964.0
8	11.42	601	613	571	595.0	817	798	512	709.0
Averages ---------->		911.2	913.3	921.6	915.4	817.0	835.0	816.3	822.8

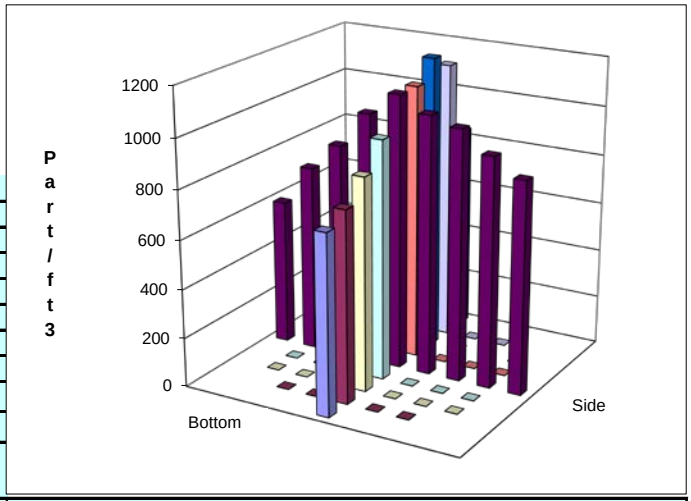
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	869.1		Mean	968.6	868.2	918.4	997.68
Min Point	595.0	-31.5%	Std. Dev.	121.0	133.1	132.8	138.21
Max Point	1115.7	28.4%	COV as %	12.5	15.3	**14.5**	**13.85**

Avg Conc 849 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	2.8	2.8	psig
Stack Temp	48.6	49.7	F
Mean Velocity	3019	3053	afpm
Ambient pressure	28.94	28.91	inHg
Ambient humidity	48.8%	42.5%	RH
Ambient temp	17.6	19.5	F
Back-Gd aerosol	2, 1, 7, 2, 2	0, 2, 0, 2, 1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	50	50	psig



Notes:

JAG
12/11/2014

Oil Used: Edwards 19

Ref. Probe Location: Ref port 5D

Probe Type / Configuration: L-Shape probe

Entries made by: J. Glissmeyer
Signature/date 12/11/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 3/9/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-39**
Date	12/11/2014	Fan configuration	**B Max**
Tester	EA, JAG	Fan Setting	**58** **Hz**
Stack Dia.	11.922 in.	Stack Temp	57.3 deg F
Stack X-Area	111.6 in.2	Start/End Time	1405 / 1535
Test Port	1D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	131.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->									
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	713	764	773	750.0	1092	1095	1095	1094.0
2	1.25	868	827	782	825.7	1128	1242	1221	1197.0
3	2.31	907	901	902	903.3	1156	1211	1257	1208.0
4	3.85	946	974	975	965.0	1122	1229	1285	1212.0
Center	5.96	1030	1084	1148	1087.3	1048	1231	1317	1198.7
5	8.07	1232	1119	1016	1122.3	1054	1072	1207	1111.0
6	9.61	1179	1168	1092	1146.3	808	937	1051	932.0
7	10.67	1184	1160	1071	1138.3	685	728	847	753.3
8	11.42	841	752	780	791.0	559	536	655	583.3
Averages ---------->		988.9	972.1	948.8	969.9	961.3	1031.2	1103.9	1032.1

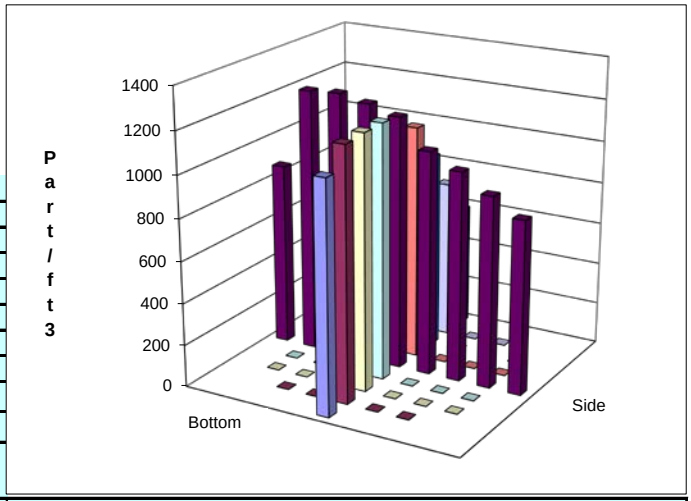
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	1001.0		Mean	1026.9	1087.4	1057.2	1109.74
Min Point	583.3	-41.7%	Std. Dev.	128.5	178.3	152.6	156.42
Max Point	1212.0	21.1%	COV as %	12.5	16.4	**14.4**	**14.10**

Avg Conc 983 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	2.8	2.8	psig
Stack Temp	51.9	62.7	F
Mean Velocity	3052	3070	afpm
Ambient pressure	28.87	28.84	inHg
Ambient humidity	42.0%	38.1%	RH
Ambient temp	21.3	22.1	F
Back-Gd aerosol	2, 1, 0, 2, 3	2, 6, 2, 6, 2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	49	49	psig



Notes:

JAG
12/11/2014

Oil Used: Edwards 19

Ref. Probe Location: Ref port 5D

Probe Type / Configuration: L-Shape probe

Entries made by: J. Glissmeyer
Signature/date 12/11/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 3/9/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-40**
Date	12/12/2014	Fan configuration	**B Max**
Tester	JAG, EA	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	52.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	0950 / 1120
Test Port	1D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	131.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**
Order ----->		2nd	1st

Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	511	391	451	451.0	789	790	782	787.0
2	1.25	514	466	496	492.0	863	885	879	875.7
3	2.31	570	503	546	539.7	896	900	879	891.7
4	3.85	539	613	607	586.3	882	853	829	854.7
Center	5.96	638	663	639	646.7	926	851	886	887.7
5	8.07	676	691	641	669.3	744	753	776	757.7
6	9.61	625	655	669	649.7	726	721	721	722.7
7	10.67	688	663	647	666.0	512	568	571	550.3
8	11.42	529	510	617	552.0	392	389	329	370.0
Averages ---------->		587.8	572.8	590.3	583.6	747.8	745.6	739.1	744.1

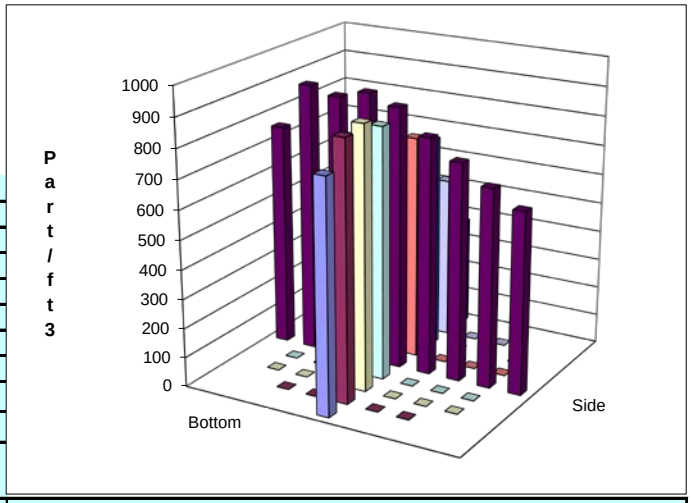
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	663.9		Mean	607.1	791.5	699.3	812.41
Min Point	370.0	-44.3%	Std. Dev.	69.5	125.4	136.5	109.22
Max Point	891.7	34.3%	COV as %	11.4	15.8	**19.5**	**13.44**

Avg Conc 651 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	2.8	2.8	psig
Stack Temp	51.9	53.1	F
Mean Velocity	3021	3139	afpm
Ambient pressure	29.32	29.3	inHg
Ambient humidity	72.2%	41.2%	RH
Ambient temp	14.6	21.6	F
Back-Gd aerosol	1, 1, 0, 3, 2	1, 0, 0, 1, 0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	49	50	psig



Notes:

JAG
12/12/2014

Oil Used: Edwards 19

Ref. Probe Location: Ref port 5D

Probe Type / Configuration: L-Shape probe

Entries made by: J Glissmeyer
Signature/date 12/12/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 3/9/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-41**
Date	12/15/2014	Fan configuration	**B Max**
Tester	EA, JEF, JAG	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	39.95 deg F
Stack X-Area	111.6 in.2	Start/End Time	0900 / 1040
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->		2nd				1st				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	particles/ft3				particles/ft3				
1	0.50	443	409	414	422.0	623	619	570	604.0	
2	1.25	485	492	464	480.3	699	659	627	661.7	
3	2.31	444	547	472	487.7	720	710	701	710.3	
4	3.85	491	593	520	534.7	747	759	729	745.0	
Center	5.96	487	594	514	531.7	804	776	767	782.3	
5	8.07	482	631	507	540.0	766	842	787	798.3	
6	9.61	572	575	519	555.3	793	776	774	781.0	
7	10.67	595	544	533	557.3	668	692	630	663.3	
8	11.42	448	362	289	366.3	523	545	606	558.0	
Averages ---------->		494.1	527.4	470.2	497.3	704.8	708.7	687.9	700.4	

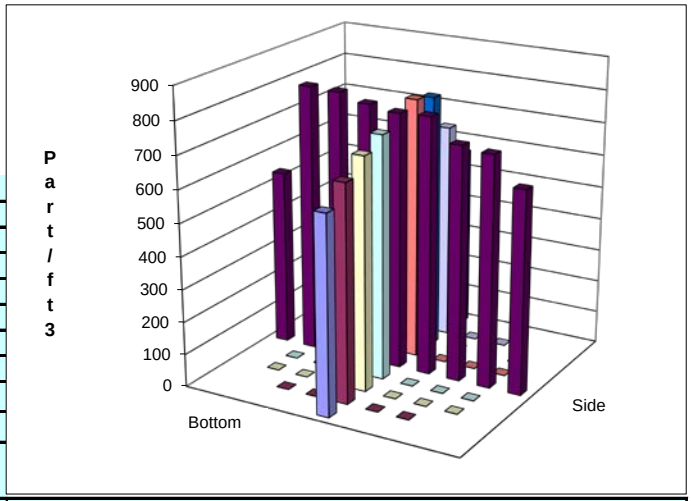
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	598.9		Mean	526.7	734.6	630.6	754.81
Min Point	366.3	-38.8%	Std. Dev.	30.8	57.1	116.5	53.82
Max Point	798.3	33.3%	COV as %	5.9	7.8	**18.5**	**7.13**

Avg Conc 592 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.6	3.6	psig
Stack Temp	39.9	40	F
Mean Velocity	3093	3078	afpm
Ambient pressure	29.7	29.7	inHg
Ambient humidity	44.0%	41.4%	RH
Ambient temp	11.9	13.8	F
Back-Gd aerosol	2, 0, 0, 0, 1	1, 0, 0, 0, 0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	48	psig



Notes: Added ~1/2 bottle of Fisher 19 to the aerosol generator, Oil level ~ 1.5" above solid part, visible in sight glass.

JAG
12/15/2014

Oil Used: Edwards

Ref. Probe Location: Ref port

Probe Type / Configuration: L-Shape probe

Entries made by: J Glissmeyer
Signature/date 12/15/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 3/9/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-42**
Date	12/15/2014	Fan configuration	**B Max**
Tester	EA, JEF, JAG	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	40.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	1047 / 1205
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	562	543	599	568.0	587	569	567	574.3
2 1.25	619	630	677	642.0	707	708	656	690.3
3 2.31	726	709	741	725.3	741	717	712	723.3
4 3.85	743	761	764	756.0	767	763	830	786.7
Center 5.96	858	839	833	843.3	796	828	830	818.0
5 8.07	806	809	857	824.0	853	826	817	832.0
6 9.61	824	865	871	853.3	796	831	806	811.0
7 10.67	793	734	792	773.0	680	687	656	674.3
8 11.42	615	610	856	693.7	508	526	512	515.3
Averages ---------->	727.3	722.2	776.7	742.1	715.0	717.2	709.6	713.9

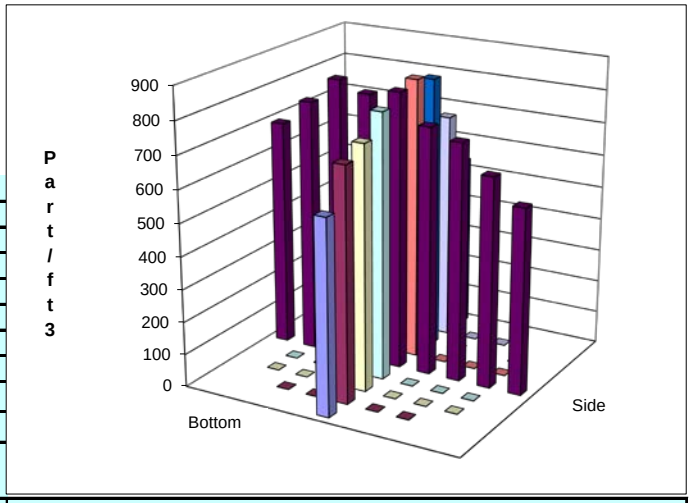
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	728.0		Mean	773.9	762.2	768.0	779.85
Min Point	515.3	-29.2%	Std. Dev.	75.0	65.0	67.7	68.60
Max Point	853.3	17.2%	COV as %	9.7	8.5	**8.8**	**8.80**

Avg Conc 715 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.8	3.8	psig
Stack Temp	40	41	F
Mean Velocity	3078	3063	afpm
Ambient pressure	29.7	29.7	inHg
Ambient humidity	41.4%	35.5%	RH
Ambient temp	13.8	15.5	F
Back-Gd aerosol	1, 0, 0, 0, 0	1, 0, 0, 0, 0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	48	psig



Notes: End data from PT-41 used as start data

JAG
12/15/2014

Oil Used: Edwards + Fisher 19

Ref. Probe Location: Ref port 5D

Probe Type / Configuration: L-Shape probe

Entries made by: J Glissmeyer
Signature/date 12/15/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 3/10/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-43**
Date	12/15/2014	Fan configuration	**B Max**
Tester	EA, JEF	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	41.05 deg F
Stack X-Area	111.6 in.2	Start/End Time	1412 / 1545
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->	2nd				1st			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	391	416	483	430.0	512	488	451	483.7
2 1.25	466	410	490	455.3	471	547	560	526.0
3 2.31	444	476	545	488.3	715	653	606	658.0
4 3.85	461	460	486	469.0	722	679	671	690.7
Center 5.96	466	448	490	468.0	738	787	792	772.3
5 8.07	470	478	459	469.0	795	791	770	785.3
6 9.61	498	404	466	456.0	734	699	766	733.0
7 10.67	477	389	490	452.0	637	667	664	656.0
8 11.42	323	258	296	292.3	509	503	493	501.7
Averages ---------->	444.0	415.4	467.2	442.2	648.1	646.0	641.4	645.2

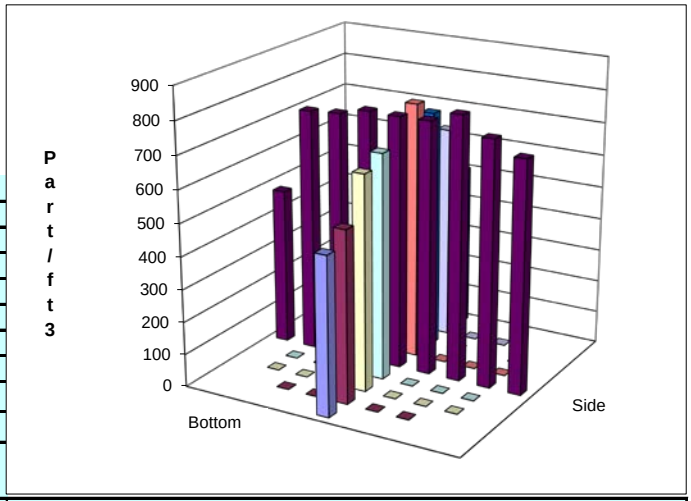
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	543.7		Mean	465.4	688.8	577.1	728.39
Min Point	292.3	-46.2%	Std. Dev.	12.4	88.3	130.8	74.05
Max Point	785.3	44.4%	COV as %	2.7	12.8	**22.7**	**10.17**

Avg Conc 534 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	3.8	3.8	psig
Stack Temp	40.9	41.2	F
Mean Velocity	3096	3051	afpm
Ambient pressure	29.7	29.6	inHg
Ambient humidity	39.1%	37.0%	RH
Ambient temp	13.1	14.7	F
Back-Gd aerosol	0, 0, 1, 1, 0	0, 2, 0, 0, 0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	49	54	psig



Notes: Side, Traverse 3, Point 1 Noticed gap btwn end of probe and end of syringe. May contribute to values in 600s after correction. Traverse 4 Put gap back. Use T4 in lieu of T3.

JEF

12/15/2014

Oil Used: Edwards + Fisher 19

Ref. Probe Location: Ref port 5D

Probe Type / Configuration: L-Shape probe

Entries made by:	Ernest Antonio	Technical Data Review performed by:	Carmen Arimescu
Signature/date	12/15/2014	Signature/date	3/10/2015
	Signature on file with original		Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-44**
Date	12/16/2014	Fan configuration	**B Max**
Tester	EA, JEF	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	40.7 deg F
Stack X-Area	111.6 in.2	Start/End Time	0946 / 1010
Test Port	2D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	143.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	327	365	393	361.7	499	506	536	513.7
2 1.25	428	529	575	510.7	482	642	636	586.7
3 2.31	574	603	628	601.7	704	738	748	730.0
4 3.85	691	707	759	719.0	725	756	812	764.3
Center 5.96	750	744	820	771.3	764	803	902	823.0
5 8.07	868	843	904	871.7	794	809	843	815.3
6 9.61	775	835	822	810.7	691	720	701	704.0
7 10.67	659	699	653	670.3	515	518	545	526.0
8 11.42	454	558	485	499.0	492	427	398	439.0
Averages ---------->	614.0	653.7	671.0	646.2	629.6	657.7	680.1	655.8

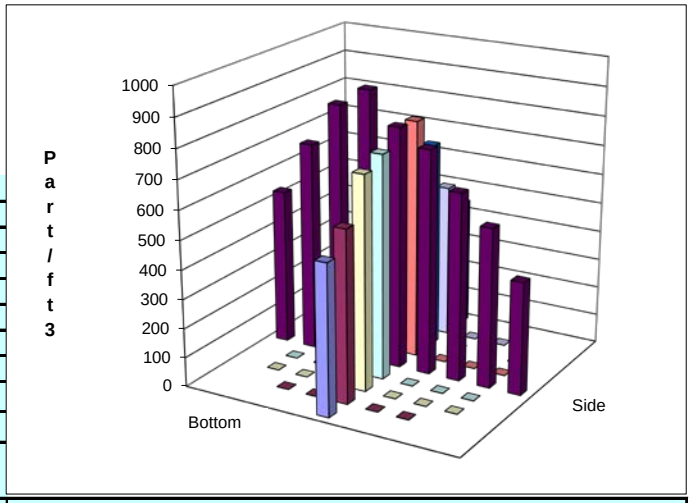
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	651.0		Mean	707.9	707.0	707.5	731.19
Min Point	361.7	-44.4%	Std. Dev.	124.6	112.7	114.1	121.03
Max Point	871.7	33.9%	COV as %	17.6	15.9	**16.1**	**16.55**

Avg Conc 633 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.8	3.8	psig
Stack Temp	39.8	41.6	F
Mean Velocity	3132	3041	afpm
Ambient pressure	29.55	29.55	inHg
Ambient humidity	45%	45%	RH
Ambient temp	14.6	14.8	C
Back-Gd aerosol	2, 0, 0, 2, 0	0, 0, 0, 0, 1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	48	psig



Notes: Wet, dreary day.

JEF 12/16/14

Oil Used: Edwards = fisher 19

Ref. Probe Location: Ref port 5D

Probe Type / Configuration: L-Shape probe

Entries made by: Julia Flaherty
Signature/date 12/16/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 3/10/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-45**
Date	12/16/2014	Fan configuration	**B Max**
Tester	EA, JEF	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	41.95 deg F
Stack X-Area	111.6 in.2	Start/End Time	1010 / 1130
Test Port	2D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	143.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->	2nd				1st			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	542	529	595	555.3	370	326	397	364.3
2 1.25	706	668	704	692.7	530	573	568	557.0
3 2.31	672	741	780	731.0	610	702	681	664.3
4 3.85	821	767	870	819.3	747	764	761	757.3
Center 5.96	860	846	879	861.7	835	820	832	829.0
5 8.07	851	794	913	852.7	832	787	820	813.0
6 9.61	822	773	868	821.0	736	713	676	708.3
7 10.67	572	548	611	577.0	580	601	570	583.7
8 11.42	347	378	403	376.0	428	434	453	438.3
Averages ---------->	688.1	671.6	735.9	698.5	629.8	635.6	639.8	635.0

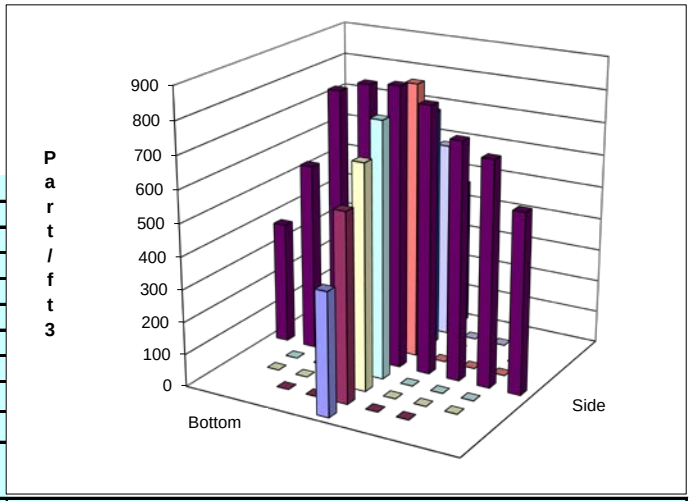
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	666.8		Mean	765.0	701.8	733.4	747.26
Min Point	364.3	-45.4%	Std. Dev.	104.0	106.5	106.3	104.79
Max Point	861.7	29.2%	COV as %	13.6	15.2	**14.5**	**14.02**

Avg Conc 644 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.8	3.8	psig
Stack Temp	41.6	42.3	F
Mean Velocity	3041	3172	afpm
Ambient pressure	29.55	29.53	inHg
Ambient humidity	45%	46%	RH
Ambient temp	14.8	15.5	C
Back-Gd aerosol	0, 0, 0, 0, 1	0, 0, 0, 2, 0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	48	psig



Notes: Still overcast, wet & dreary.
Start condition are the finish conditions from PT-44

JEF
12/16/2014

Oil Used: Edwards = fisher 19

Ref. Probe Location: Ref port 5D

Probe Type / Configuration: L-Shape probe

Entries made by: Julia Flaherty
Signature/date 12/16/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 3/10/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-46**
Date	12/16/2014	Fan configuration	**B Max**
Tester	EA, JAG	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	43.95 deg F
Stack X-Area	111.6 in.2	Start/End Time	1400 / 1525
Test Port	2D	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	143.9 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	570	570	543	561.0	850	841	888	859.7
2 1.25	715	702	741	719.3	941	945	1019	968.3
3 2.31	760	792	818	790.0	1028	1024	1007	1019.7
4 3.85	790	812	766	789.3	1100	1010	1151	1087.0
Center 5.96	866	855	788	836.3	1124	1098	1081	1101.0
5 8.07	849	829	797	825.0	975	990	1003	989.3
6 9.61	709	710	1034	817.7	731	873	893	832.3
7 10.67	448	486	454	462.7	597	656	614	622.3
8 11.42	377	343	380	366.7	423	469	503	465.0
Averages ---------->	676.0	677.7	702.3	685.3	863.2	878.4	906.6	882.7

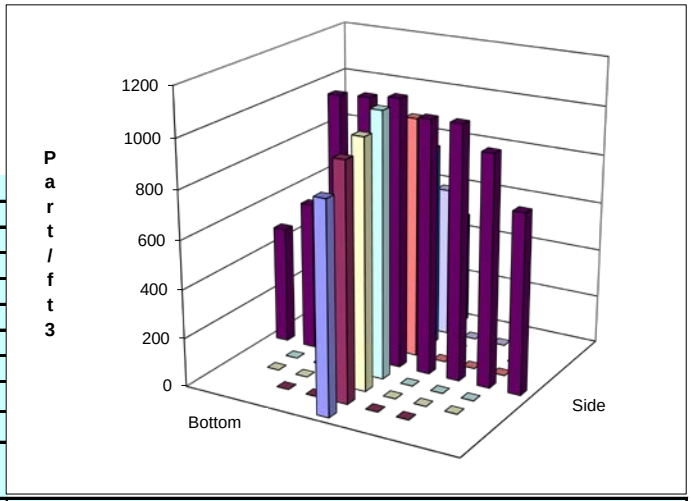
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	784.0		Mean	748.6	945.7	847.2	965.62
Min Point	366.7	-53.2%	Std. Dev.	131.8	168.0	177.5	165.41
Max Point	1101.0	40.4%	COV as %	17.6	17.8	**21.0**	**17.13**

Avg Conc 761 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.8	3.8	psig
Stack Temp	43.3	44.6	F
Mean Velocity	3066	3004	afpm
Ambient pressure	29.53	29.54	inHg
Ambient humidity	42.7%	42.2%	RH
Ambient temp	16.2	17.1	C
Back-Gd aerosol	2, 1, 0, 1, 0	1, 0, 0, 0, 0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	47	48	psig



Notes:

JAG
12/16/2014

Oil Used: Edwards = fisher 19

Ref. Probe Location: Ref port 5D

Probe Type / Configuration: L-Shape probe

Entries made by: J Glissmeyer
Signature/date 12/16/2014
Signature on file with original

Technical Data Review performed by: Carmen Arimescu
Signature/date 3/10/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-47**
Date	12/18/2014	Fan configuration	**B Norm**
Tester	EA, JAG	Fan Setting	**45** **Hz**
Stack Dia.	11.922 in.	Stack Temp	41 deg F
Stack X-Area	111.6 in.2	Start/End Time	0915 / 1050
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->		2nd				1st				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	particles/ft3				particles/ft3				
1	0.50	795	830	810	811.7	848	890	848	862.0	
2	1.25	827	874	911	870.7	895	973	885	917.7	
3	2.31	924	931	883	912.7	970	1010	953	977.7	
4	3.85	980	943	917	946.7	1006	964	1114	1028.0	
Center	5.96	963	935	966	954.7	1103	1195	1108	1135.3	
5	8.07	873	866	833	857.3	1096	1153	1119	1122.7	
6	9.61	829	817	782	809.3	1040	1063	1114	1072.3	
7	10.67	771	706	677	718.0	984	1003	992	993.0	
8	11.42	598	471	488	519.0	849	917	900	888.7	
Averages ---------->		840.0	819.2	807.4	822.2	976.8	1018.7	1003.7	999.7	

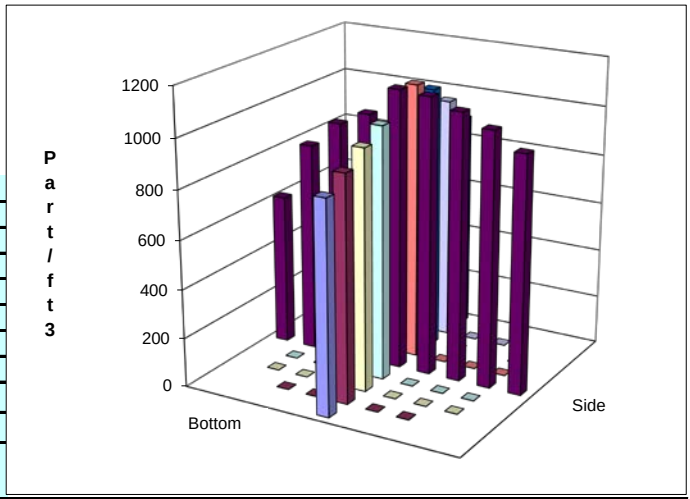
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	911.0		Mean	867.0	1035.2	951.1	1033.19
Min Point	519.0	-43.0%	Std. Dev.	83.4	79.6	117.3	86.43
Max Point	1135.3	24.6%	COV as %	9.6	7.7	**12.3**	**8.37**

Avg Conc 894 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Barc		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	40.2	41.8	F
Mean Velocity	2373	2354	afpm
Ambient pressure	29.62	29.62	inHg
Ambient humidity	42.7%	42.1%	RH
Ambient temp	15.5	16.5	C
Back-Gd aerosol	2, 0, 0, 0, 0	0, 0, 0, 0, 0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	48	psig



Notes: Overcast skies, wet out.
Maybe try a little higher velocity next time.

EA 12/18/14

Oil Used: Edwards + Fisher 19

Ref. Probe Location: Ref port 5D

Probe Type / Configuration: L-Shape probe

Entries made by: Ernest Antonio
Signature/date 12/18/2014
Signature on file with Original

Technical Data Review performed by: Carmen Arimescu
Signature/date 3/10/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-48**
Date	12/19/2014	Fan configuration	**B Norm**
Tester	EA	Fan Setting	**48** **Hz**
Stack Dia.	11.922 in.	Stack Temp	44.4 deg F
Stack X-Area	111.6 in.2	Start/End Time	0839 / 1014
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	626	654	621	633.7	531	674	685	630.0
2 1.25	706	738	720	721.3	650	795	827	757.3
3 2.31	737	766	770	757.7	750	851	883	828.0
4 3.85	803	871	886	853.3	849	994	1003	948.7
Center 5.96	928	862	833	874.3	967	1007	1105	1026.3
5 8.07	927	968	955	950.0	1042	1044	1045	1043.7
6 9.61	937	949	947	944.3	1016	1013	1025	1018.0
7 10.67	872	914	850	878.7	869	917	1000	928.7
8 11.42	655	592	690	645.7	736	849	777	787.3
Averages ---------->	799.0	812.7	808.0	806.6	823.3	904.9	927.8	885.3

All	pt/ft3	Dev. from mean
Mean	845.9	
Min Point	630.0	-25.5%
Max Point	1043.7	23.4%

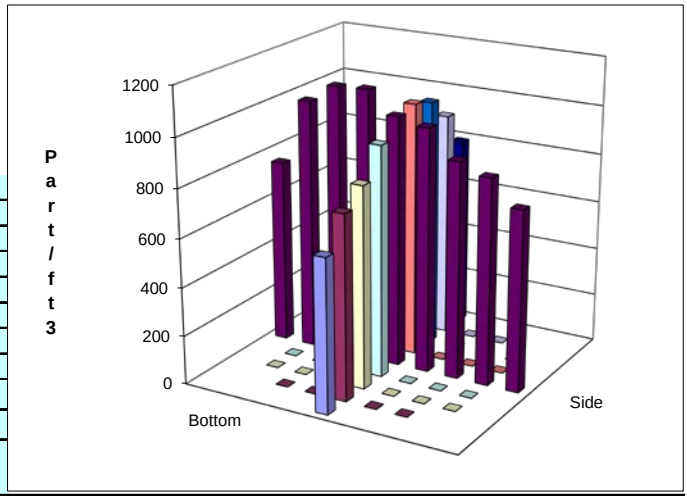
Center 2/3	Side	Bottom	All	Normlzd
Mean	854.2	935.8	895.0	969.28
Std. Dev.	86.9	108.2	103.3	106.82
COV as %	10.2	11.6	**11.5**	**11.02**

Avg Conc 833 pt/ft3

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	43	45.8	F
Mean Velocity	2482	2708	afpm
Ambient pressure	29.5	29.5	inHg
Ambient humidity	45%	46%	RH
Ambient temp	16.4	16.1	C
Back-Gd aerosol	0, 0, 0, 0, 0	0, 0, 0, 0, 1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	49	54	psig

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			



Notes: Wet out, partially cloudy.

EA
12/19/2014

Oil Used: Edwards + Fisher 19

Ref. Probe Location: Ref port 5D

Probe Type / Configuration: L-Shape probe

Entries made by: Ernest Antonio
Signature/date 12/19/2014
Signature on file with Original

Technical Data Review performed by: Carmen Arimescu
Signature/date 3/10/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-49**
Date	12/19/2014	Fan configuration	**B Norm**
Tester	EA, YFS	Fan Setting	**48** **Hz**
Stack Dia.	11.922 in.	Stack Temp	47.35 deg F
Stack X-Area	111.6 in.2	Start/End Time	1028 / 1147
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->	2nd				1st			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 / 0.50	669	825	831	775.0	695	805	814	771.3
2 / 1.25	920	928	856	901.3	852	908	980	913.3
3 / 2.31	846	937	975	919.3	954	1063	1063	1026.7
4 / 3.85	1057	1099	1097	1084.3	1024	1075	1129	1076.0
Center / 5.96	1086	1094	1176	1118.7	1156	1194	1191	1180.3
5 / 8.07	1215	1097	1027	1113.0	1157	1299	1252	1236.0
6 / 9.61	1132	1174	1094	1133.3	1102	1120	1218	1146.7
7 / 10.67	1160	1075	1091	1108.7	1052	1048	1154	1084.7
8 / 11.42	982	763	775	840.0	876	879	972	909.0
Averages ---------->	1007.4	999.1	991.3	999.3	985.3	1043.4	1085.9	1038.2

All	pt/ft3	Dev. from mean
Mean	1018.8	
Min Point	771.3	-24.3%
Max Point	1236.0	21.3%

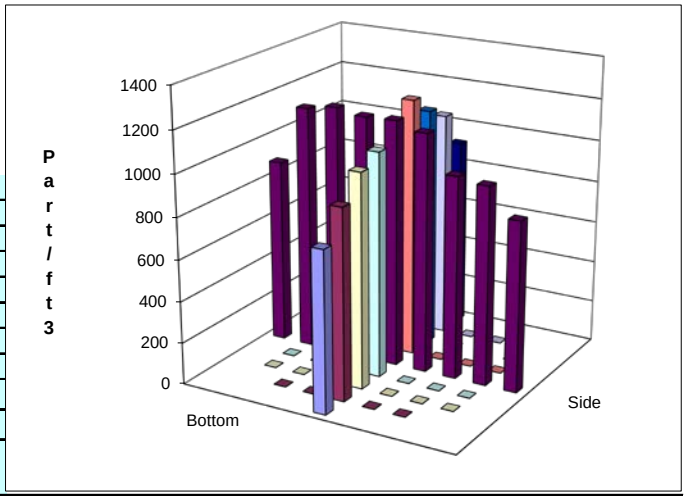
Center 2/3	Side	Bottom	All	Normlzd
Mean	1054.1	1094.8	1074.5	1103.51
Std. Dev.	99.4	106.4	101.2	101.93
COV as %	9.4	9.7	**9.4**	**9.24**

Avg Conc 1002 pt/ft3

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	45.8	48.9	F
Mean Velocity	2708	2544	afpm
Ambient pressure	29.5	29.5	inHg
Ambient humidity	46%	44%	RH
Ambient temp	16.1	18.1	C
Back-Gd aerosol	0, 0, 0, 0, 1	1, 3, 1, 1, ,2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	54	48	psig

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			



Notes: Start condtions are same as finish conditions on previous test (PT-48). Traverse side, #4 repeated, the probe slipped in run 1.

YFS
12/19/2014

Oil Used: Edwards + Fisher 19

Ref. Probe Location: Ref port 5D

Probe Type / Configuration: L-Shape probe

Entries made by: Yin -Fong Su
Signature/date 12/19/2014
Signature on file with Original

Technical Data Review performed by: Carmen Arimescu
Signature/date 3/10/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT-50**
Date	12/19/2014	Fan configuration	**B Min**
Tester	YFS, ES	Fan Setting	**28** **Hz**
Stack Dia.	11.922 in.	Stack Temp	53.5 deg F
Stack X-Area	111.6 in.2	Start/End Time	1400 / 1545
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	833	765	811	803.0	878	911	985	924.7
2 1.25	804	820	860	828.0	924	985	1031	980.0
3 2.31	860	846	860	855.3	976	983	1018	992.3
4 3.85	932	916	864	904.0	967	1076	1058	1033.7
Center 5.96	954	959	929	947.3	1056	1112	1134	1100.7
5 8.07	988	904	984	958.7	1031	1092	1244	1122.3
6 9.61	899	907	862	889.3	1050	1038	1093	1060.3
7 10.67	921	926	885	910.7	1004	1119	1114	1079.0
8 11.42	833	827	768	809.3	1021	1064	1059	1048.0
Averages ---------->	891.6	874.4	869.2	878.4	989.7	1042.2	1081.8	1037.9

All	pt/ft3	Dev. from mean
Mean	958.1	
Min Point	803.0	-16.2%
Max Point	1122.3	17.1%

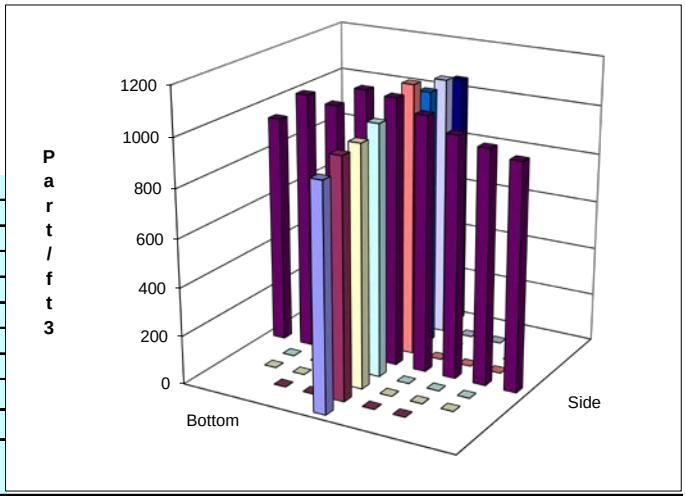
Center 2/3	Side	Bottom	All	Normlzd
Mean	899.0	1052.6	975.8	1048.59
Std. Dev.	46.7	53.5	93.2	51.96
COV as %	5.2	5.1	**9.5**	**4.96**

Avg Conc 950 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	1.5	1.5	psig
Stack Temp	55.4	51.6	F
Mean Velocity	1475	1478	afpm
Ambient pressure	29.5	29.5	inHg
Ambient humidity	36%	46%	RH
Ambient temp	20.8	18.6	C
Back-Gd aerosol	0, 0, 0, 0, 2	0, 0, 0, 0, 1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	48	48	psig



Notes:

EA

12/19/2014

Oil Used: Edwards + Fisher 19

Ref. Probe Location: Ref port 5D

Probe Type / Configuration: L-Shape probe

Entries made by: Ernest Antonio
Signature/date 12/19/2014
Signature on file with Original

Technical Data Review performed by: Carmen Arimescu
Signature/date 3/10/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 51**
Date	1/22/2015	Fan configuration	**Fan B Min**
Tester	CA, EA	Fan Setting	**28** **Hz**
Stack Dia.	11.922 in.	Stack Temp	37.7 deg F
Stack X-Area	111.6 in.2	Start/End Time	1000/1137
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->		2nd				1st				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	particles/ft3				particles/ft3				
1	0.50	810	781	764	785.0	900	903	872	891.7	
2	1.25	736	779	842	785.7	896	1032	925	951.0	
3	2.31	716	825	837	792.7	1005	930	945	960.0	
4	3.85	949	887	961	932.3	938	974	1041	984.3	
Center	5.96	937	1024	974	978.3	1054	993	1068	1038.3	
5	8.07	997	1007	1019	1007.7	975	939	1016	976.7	
6	9.61	1022	1029	1035	1028.7	890	930	941	920.3	
7	10.67	1081	1006	1053	1046.7	920	910	938	922.7	
8	11.42	884	800	836	840.0	763	799	804	788.7	
Averages ---------->		903.6	904.2	924.6	910.8	926.8	934.4	950.0	937.1	

All	pt/ft3	Dev. from mean
Mean	923.9	
Min Point	785.0	-15.0%
Max Point	1046.7	13.3%

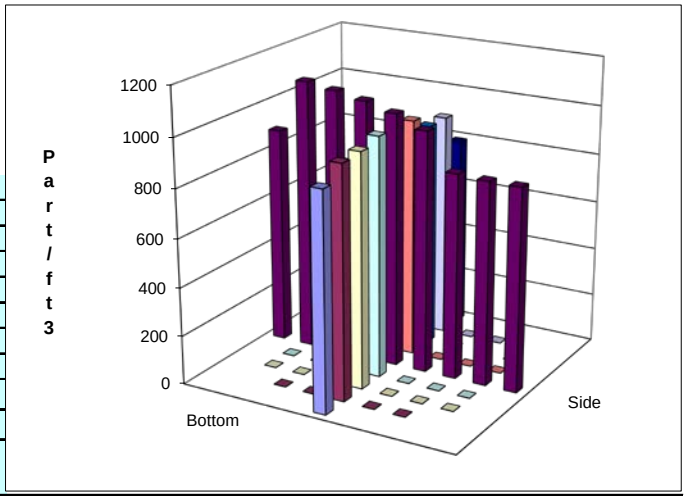
Center 2/3	Side	Bottom	All	Normlzd
Mean	938.9	964.8	951.8	980.60
Std. Dev.	108.7	40.6	80.0	84.68
COV as %	11.6	4.2	**8.4**	**8.64**

Avg Conc 913 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	2.0	2.0	psig
Stack Temp	36.9	38.5	F
Mean Velocity	1600	1589	afpm
Ambient pressure	30.1	30.2	inHg
Ambient humidity	29.2%	30.7%	RH
Ambient temp	15.6	16.2	C
Back-Gd aerosol	0 ,0, 1, 1, 0	1, 1, 0, 0, 0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	50	58	psig



Notes: We stoped after the bottom to protect from the rain the outside OPC.

CA

1/22/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 1/22/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 52**
Date	1/22/2015	Fan configuration	**Fan B Min**
Tester	CA, EA	Fan Setting	**28** **Hz**
Stack Dia.	11.922 in.	Stack Temp	38.9 deg F
Stack X-Area	111.6 in.2	Start/End Time	1151/1312
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	644	687	730	687.0	957	896	888	913.7
2 1.25	781	755	743	759.7	954	960	991	968.3
3 2.31	747	834	831	804.0	1073	1019	971	1021.0
4 3.85	875	854	868	865.7	1013	1010	1058	1027.0
Center 5.96	964	1013	1011	996.0	1060	1156	1076	1097.3
5 8.07	1055	1047	1045	1049.0	1110	977	1050	1045.7
6 9.61	1024	1018	1038	1026.7	974	1018	1013	1001.7
7 10.67	1086	986	1082	1051.3	1015	1022	973	1003.3
8 11.42	879	881	886	882.0	901	982	914	932.3
Averages ---------->	895.0	897.2	914.9	902.4	1006.3	1004.4	992.7	1001.1

All	pt/ft3	Dev. from mean
Mean	951.8	
Min Point	687.0	-27.8%
Max Point	1097.3	15.3%

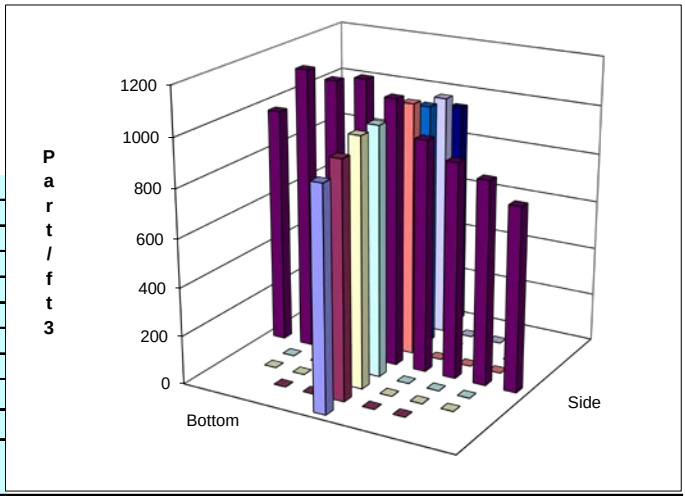
Center 2/3	Side	Bottom	All	Normlzd
Mean	936.0	1023.5	979.8	1027.38
Std. Dev.	123.4	40.6	99.2	96.47
COV as %	13.2	4.0	**10.1**	**9.39**

Avg Conc 940 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar	122277883		8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	2.0	2.0	psig
Stack Temp	38.5	39.3	F
Mean Velocity	1580	1660	afpm
Ambient pressure	30.02	30.01	inHg
Ambient humidity	42.7%	34.4%	RH
Ambient temp	13.8	15.7	C
Back-Gd aerosol	1, 1, 0, 0, 0	0, 0, 0, 0, 0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	58	58	psig



Notes: We used the velocity, stack temperature and BackG from PT51

CA

1/22/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 1/22/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 53**
Date	1/23/2015	Fan configuration	**Fan A Min**
Tester	CA, EA	Fan Setting	**26** **Hz**
Stack Dia.	11.922 in.	Stack Temp	37.95 deg F
Stack X-Area	111.6 in.2	Start/End Time	850/1020
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I4**
		Damper Configuration	**Scale**

	Order ----->	2nd				1st			
	Traverse-->	Side				Bottom			
	Trial ---->	1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	797	1121	1130	1016.0	1036	1016	1081	1044.3
2	1.25	1070	1080	1196	1115.3	1071	1129	1152	1117.3
3	2.31	1197	1195	1288	1226.7	1139	1172	1184	1165.0
4	3.85	1156	1161	1227	1181.3	1138	1168	1183	1163.0
Center	5.96	1132	1246	1275	1217.7	1159	1171	1272	1200.7
5	8.07	1219	1205	1281	1235.0	1200	1204	1222	1208.7
6	9.61	1123	1241	1240	1201.3	1183	1197	1229	1203.0
7	10.67	1091	1170	1161	1140.7	1138	1056	1180	1124.7
8	11.42	1041	1050	1039	1043.3	1103	1105	1142	1116.7
Averages ---------->		1091.8	1163.2	1204.1	1153.0	1129.7	1135.3	1182.8	1149.3

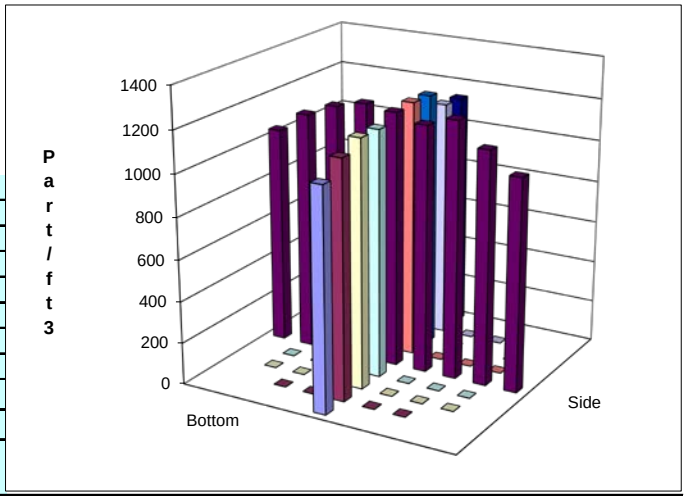
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	1151.1		Mean	1188.3	1168.9	1178.6	1186.87
Min Point	1016.0	-11.7%	Std. Dev.	45.3	37.5	41.2	40.21
Max Point	1235.0	7.3%	COV as %	3.8	3.2	**3.5**	**3.39**

Avg Conc 1144 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	2.0	2.0	psig
Stack Temp	36.8	39.1	F
Mean Velocity	1590	1511	afpm
Ambient pressure	30.13	30.13	inHg
Ambient humidity	52.9%	33.3%	RH
Ambient temp	11.8	16.4	C
Back-Gd aerosol	0, 0, 0, 0, 0	0, 0, 0, 0, 1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	50	58	psig



Notes:

CA

1/23/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 1/23/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 54**
Date	1/23/2015	Fan configuration	**Fan A Min**
Tester	CA, EA	Fan Setting	**26** **Hz**
Stack Dia.	11.922 in.	Stack Temp	39.65 deg F
Stack X-Area	111.6 in.2	Start/End Time	1029/1143
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I4**
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 / 0.50	1142	1165	1247	1184.7	1305	1369	1355	1343.0
2 / 1.25	1252	1301	1318	1290.3	1477	1439	1401	1439.0
3 / 2.31	1267	1292	1299	1286.0	1521	1440	1447	1469.3
4 / 3.85	1303	1260	1326	1296.3	1498	1521	1474	1497.7
Center / 5.96	1302	1323	1218	1281.0	1547	1542	1451	1513.3
5 / 8.07	1299	1322	1257	1292.7	1538	1572	1580	1563.3
6 / 9.61	1273	1215	1238	1242.0	1531	1514	1484	1509.7
7 / 10.67	1157	1245	1221	1207.7	1534	1550	1431	1505.0
8 / 11.42	1064	1177	1148	1129.7	1417	1458	1412	1429.0
Averages ---------->	1228.8	1255.6	1252.4	1245.6	1485.3	1489.4	1448.3	1474.4

All	pt/ft3	Dev. from mean
Mean	1360.0	
Min Point	1129.7	-16.9%
Max Point	1563.3	15.0%

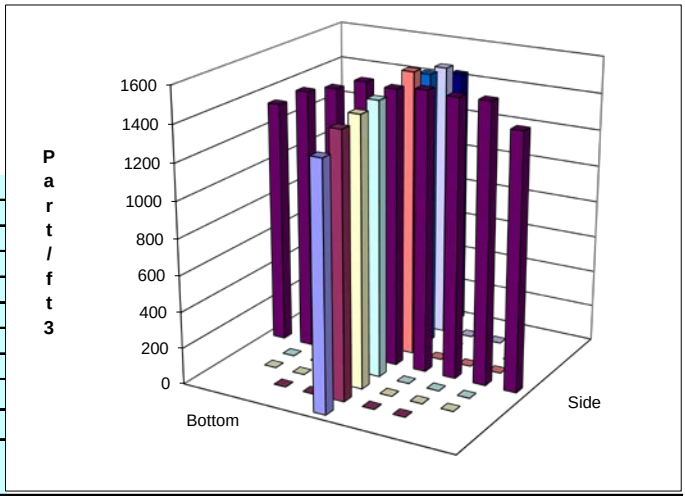
Center 2/3	Side	Bottom	All	Normlzd
Mean	1270.9	1499.6	1385.2	1500.48
Std. Dev.	33.3	38.7	123.7	37.50
COV as %	2.6	2.6	**8.9**	**2.50**

Avg Conc 1355 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	2.0	2.0	psig
Stack Temp	39.1	40.2	F
Mean Velocity	1511	1532	afpm
Ambient pressure	30.13	30.11	inHg
Ambient humidity	33.3%	33.6%	RH
Ambient temp	16.4	16	C
Back-Gd aerosol	0, 0, 0, 0, 1	0, 1, 0, 0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	58	58	psig



Notes: We used the start data from PT53 finish data.

CA

1/23/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 1/23/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 55**
Date	1/26/2015	Fan configuration	**Fan A Min**
Tester	CA, EA	Fan Setting	**26** **Hz**
Stack Dia.	11.922 in.	Stack Temp	42.3 deg F
Stack X-Area	111.6 in.2	Start/End Time	910 / 1044
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I4**
		Damper Configuration	**Scale**

Order ----->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	663	793	788	748.0	850	813	758	807.0
2	1.25	834	833	866	844.3	881	909	839	876.3
3	2.31	880	873	857	870.0	997	889	883	923.0
4	3.85	872	829	831	844.0	941	913	867	907.0
Center	5.96	728	829	836	797.7	916	876	911	901.0
5	8.07	815	859	843	839.0	921	893	844	886.0
6	9.61	780	803	822	801.7	952	920	854	908.7
7	10.67	798	881	758	812.3	963	856	808	875.7
8	11.42	768	760	708	745.3	848	804	827	826.3
Averages ---------->		793.1	828.9	812.1	811.4	918.8	874.8	843.4	879.0

All	pt/ft3	Dev. from mean
Mean	845.2	
Min Point	745.3	-11.8%
Max Point	923.0	9.2%

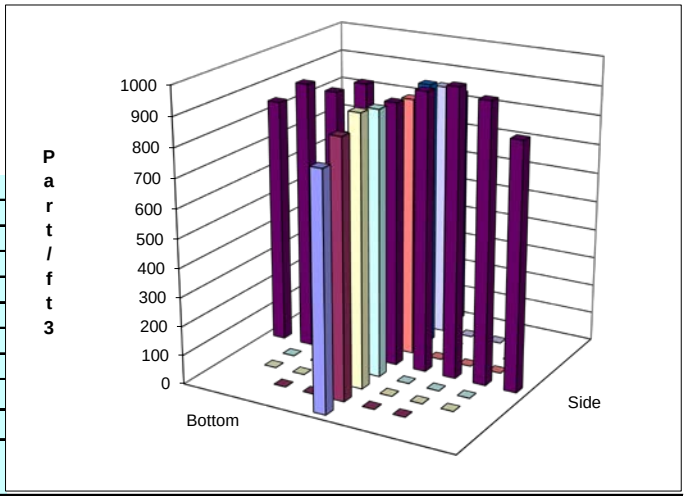
Center 2/3	Side	Bottom	All	Normlzd
Mean	829.9	896.8	863.3	917.09
Std. Dev.	26.6	17.9	41.0	31.74
COV as %	3.2	2.0	**4.8**	**3.46**

Avg Conc 845 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	1.5	1.5	psig
Stack Temp	41.7	42.9	F
Mean Velocity	1535	1521	afpm
Ambient pressure	29.66	29.7	inHg
Ambient humidity	42.5%	46.5%	RH
Ambient temp	18.1	15.3	C
Back-Gd aerosol	2, 3, 0, 1, 3	0, 0, 0, 0, 0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	58	58	psig



Notes: With the printer set at Round Average the number we got were with decimal both on print and on the screen so we decided to round the numbers where was needed.
CA
1/26/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 1/26/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
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PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 56**
Date	1/26/2015	Fan configuration	**Fan A Max**
Tester	CA, EA	Fan Setting	**51.2** **Hz**
Stack Dia.	11.922 in.	Stack Temp	43.65 deg F
Stack X-Area	111.6 in.2	Start/End Time	1055 / 1216
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I4**
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 / 0.50	538	541	549	542.7	512	465	444	473.7
2 / 1.25	675	622	634	643.7	603	629	609	613.7
3 / 2.31	631	671	706	669.3	693	698	700	697.0
4 / 3.85	641	690	702	677.7	722	738	718	726.0
Center / 5.96	655	586	617	619.3	749	691	722	720.7
5 / 8.07	588	622	655	621.7	689	675	703	689.0
6 / 9.61	586	599	607	597.3	693	713	721	709.0
7 / 10.67	547	559	499	535.0	644	630	654	642.7
8 / 11.42	384	333	356	357.7	502	477	567	515.3
Averages ---------->	582.8	580.3	591.7	584.9	645.2	635.1	648.7	643.0

All	pt/ft3	Dev. from mean
Mean	614.0	
Min Point	357.7	-41.7%
Max Point	726.0	18.2%

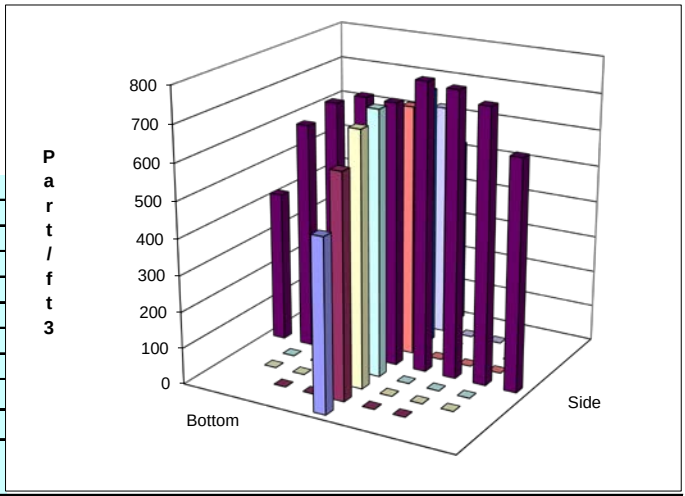
Center 2/3	Side	Bottom	All	Normlzd
Mean	623.4	685.4	654.4	705.43
Std. Dev.	48.3	42.0	54.1	51.96
COV as %	7.7	6.1	**8.3**	**7.37**

Avg Conc 607 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	2.0	2.0	psig
Stack Temp	43.4	43.9	F
Mean Velocity	3148	3134	afpm
Ambient pressure	29.7	29.6	inHg
Ambient humidity	46.5%	46.1%	RH
Ambient temp	15.3	15.5	C
Back-Gd aerosol	9, 22, 9, 4, 4	0, 4, 2, 1, 2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	58	58	psig



Notes: Data printed by OPC showed decimals.
These values were rounded to nearest whole number and recorded on this data sheet.

EA
1/26/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 1/26/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 57**
Date	1/28/2015	Fan configuration	**Fan A Max**
Tester	CA, EA	Fan Setting	**51.2** **Hz**
Stack Dia.	11.922 in.	Stack Temp	40.15 deg F
Stack X-Area	111.6 in.2	Start/End Time	900/1024
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I4**
		Damper Configuration	**Scale**

Order ----->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	706	682	761	716.3	695	722	745	720.7
2	1.25	878	834	890	867.3	921	948	954	941.0
3	2.31	877	868	957	900.7	952	1011	957	973.3
4	3.85	906	891	951	916.0	1024	1009	1044	1025.7
Center	5.96	921	853	925	899.7	1050	982	1019	1017.0
5	8.07	821	826	848	831.7	954	958	954	955.3
6	9.61	802	787	776	788.3	954	971	962	962.3
7	10.67	651	765	732	716.0	848	860	845	851.0
8	11.42	445	514	453	470.7	694	744	688	708.7
Averages ---------->		778.6	780.0	810.3	789.6	899.1	911.7	907.6	906.1

All	pt/ft3	Dev. from mean
Mean	847.9	
Min Point	470.7	-44.5%
Max Point	1025.7	21.0%

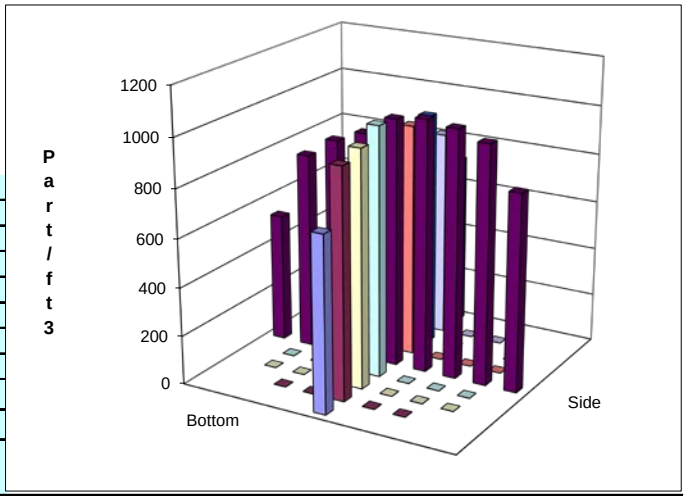
Center 2/3	Side	Bottom	All	Normlzd
Mean	845.7	960.8	903.2	958.38
Std. Dev.	72.6	57.7	86.9	68.24
COV as %	8.6	6.0	**9.6**	**7.12**

Avg Conc 834 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	2.5	2.5	psig
Stack Temp	39.8	40.5	F
Mean Velocity	3223	3088	afpm
Ambient pressure	29.97	30.01	inHg
Ambient humidity	36.8%	35.1%	RH
Ambient temp	16.7	17.9	C
Back-Gd aerosol	2,1,8,1,1	2,2,0,0,1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	58	50	psig



Notes:

CA

1/28/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 1/28/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 58**
Date	1/28/2015	Fan configuration	**Fan A Max**
Tester	CA, EA	Fan Setting	**51.2** **Hz**
Stack Dia.	11.922 in.	Stack Temp	41.05 deg F
Stack X-Area	111.6 in.2	Start/End Time	1030/1143
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I4**
		Damper Configuration	**Scale**

Order ----->		1st				2nd			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	733	675	668	692.0	787	753	760	766.7
2	1.25	892	887	806	861.7	945	952	914	937.0
3	2.31	948	952	900	933.3	1052	998	1046	1032.0
4	3.85	999	952	968	973.0	1065	1088	1067	1073.3
Center	5.96	1013	959	870	947.3	1030	1054	1010	1031.3
5	8.07	921	879	780	860.0	1006	1004	1019	1009.7
6	9.61	797	737	813	782.3	1042	967	984	997.7
7	10.67	697	638	792	709.0	932	886	879	899.0
8	11.42	434	508	597	513.0	759	717	766	747.3
Averages ---------->		826.0	798.6	799.3	808.0	957.6	935.4	938.3	943.8

All	pt/ft3	Dev. from mean
Mean	875.9	
Min Point	513.0	-41.4%
Max Point	1073.3	22.5%

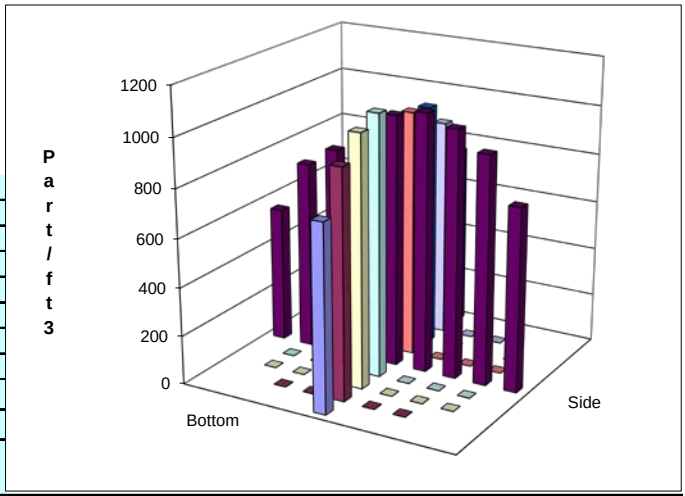
Center 2/3	Side	Bottom	All	Normlzd
Mean	866.7	997.1	931.9	970.33
Std. Dev.	95.1	60.0	102.1	85.94
COV as %	11.0	6.0	**11.0**	**8.86**

Avg Conc 862 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	2.5	2.5	psig
Stack Temp	40.5	41.6	F
Mean Velocity	3088	3112	afpm
Ambient pressure	30.1	30.02	inHg
Ambient humidity	35.1%	36.1%	RH
Ambient temp	17.9	16.6	C
Back-Gd aerosol	2,2,0,0,1	3,2,1,1,0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	50	58	psig



Notes:

CA

1/28/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 1/28/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 59**
Date	1/29/2015	Fan configuration	**Fan A Normal**
Tester	CA, EA	Fan Setting	**43** **Hz**
Stack Dia.	11.922 in.	Stack Temp	42.2 deg F
Stack X-Area	111.6 in.2	Start/End Time	900/1030
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I4**
		Damper Configuration	**Scale**

		Side				Bottom			
Order ----->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	905	862	880	882.3	802	848	822	824.0
2	1.25	1005	1028	1035	1022.7	1026	1016	949	997.0
3	2.31	1075	1047	1078	1066.7	1059	1068	1066	1064.3
4	3.85	1063	1002	1104	1056.3	1146	1079	1116	1113.7
Center	5.96	1044	1043	1091	1059.3	1162	1064	1092	1106.0
5	8.07	1027	975	1034	1012.0	1109	1089	1096	1098.0
6	9.61	935	969	973	959.0	1114	1036	1042	1064.0
7	10.67	791	878	874	847.7	1015	971	1051	1012.3
8	11.42	605	631	556	597.3	808	781	777	788.7
Averages ---------->		938.9	937.2	958.3	944.8	1026.8	994.7	1001.2	1007.6

All	pt/ft3	Dev. from mean
Mean	976.2	
Min Point	597.3	-38.8%
Max Point	1113.7	14.1%

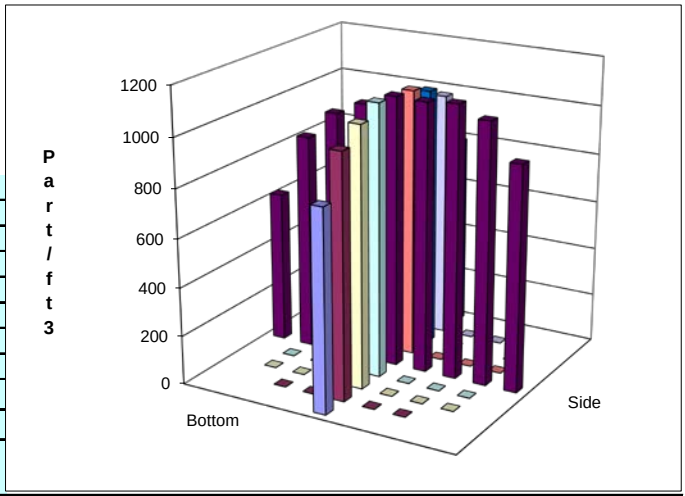
Center 2/3	Side	Bottom	All	Normlzd
Mean	1003.4	1065.0	1034.2	1056.32
Std. Dev.	78.1	45.7	69.3	64.15
COV as %	7.8	4.3	**6.7**	**6.07**

Avg Conc 963 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	2.4	2.4	psig
Stack Temp	41.4	43.0	F
Mean Velocity	2592	2650	afpm
Ambient pressure	30.04	30.05	inHg
Ambient humidity	33.2%	36.5%	RH
Ambient temp	17.8	15.3	C
Back-Gd aerosol	5,3,5,5,10	2,1,1,1,2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	58	58	psig



Notes:

CA

1/29/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 1/29/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 60**
Date	1/29/2015	Fan configuration	**Fan A Normal**
Tester	CA, EA	Fan Setting	**43** **Hz**
Stack Dia.	11.922 in.	Stack Temp	43.6 deg F
Stack X-Area	111.6 in.2	Start/End Time	1038/1151
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I4**
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 / 0.50	838	818	786	814.0	960	889	912	920.3
2 / 1.25	1022	1000	927	983.0	1107	1076	1079	1087.3
3 / 2.31	1035	1000	1019	1018.0	1216	1156	1174	1182.0
4 / 3.85	1070	933	1003	1002.0	1179	1149	1165	1164.3
Center / 5.96	992	994	955	980.3	1171	1200	1180	1183.7
5 / 8.07	1032	980	936	982.7	1141	1182	1157	1160.0
6 / 9.61	927	966	933	942.0	1156	1154	1199	1169.7
7 / 10.67	871	848	870	863.0	1107	1147	1088	1114.0
8 / 11.42	739	690	816	748.3	874	884	1003	920.3
Averages ---------->	947.3	914.3	916.1	925.9	1101.2	1093.0	1106.3	1100.2

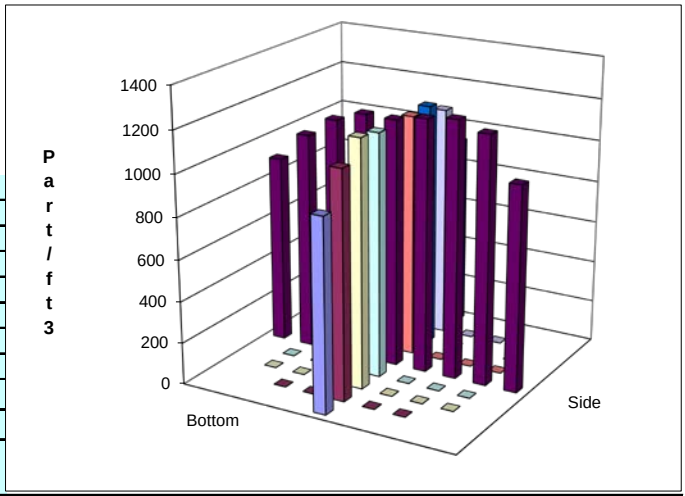
All	pt/ft3	Dev. from mean	***Center 2/3***	Side	Bottom	All	Normlzd
Mean	1013.1		Mean	967.3	1151.6	1059.4	1159.74
Min Point	748.3	-26.1%	Std. Dev.	51.6	36.6	104.8	49.80
Max Point	1183.7	16.8%	COV as %	5.3	3.2	**9.9**	**4.29**

Avg Conc 1004 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	2.3	2.3	psig
Stack Temp	43.0	44.2	F
Mean Velocity	2650	2824	afpm
Ambient pressure	30.05	30.04	inHg
Ambient humidity	36.5%	35.4%	RH
Ambient temp	15.3	16.8	C
Back-Gd aerosol	2,1,1,1,2	1,0,1,0,0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	58	58	psig



Notes:

CA

1/29/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 1/29/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 61**
Date	2/2/2015	Fan configuration	**Fan A Normal**
Tester	CA, EA	Fan Setting	**43** **Hz**
Stack Dia.	11.922 in.	Stack Temp	39.95 deg F
Stack X-Area	111.6 in.2	Start/End Time	907/1034
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I4**
		Damper Configuration	**Scale**

Order ----->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	733	695	709	712.3	656	722	665	681.0
2	1.25	862	908	822	864.0	785	860	868	837.7
3	2.31	872	993	921	928.7	912	858	841	870.3
4	3.85	906	953	950	936.3	948	957	984	963.0
Center	5.96	872	849	940	887.0	985	941	958	961.3
5	8.07	893	894	872	886.3	866	925	963	918.0
6	9.61	909	853	900	887.3	884	891	874	883.0
7	10.67	790	788	747	775.0	785	852	837	824.7
8	11.42	622	540	583	581.7	747	767	737	750.3
Averages ---------->		828.8	830.3	827.1	828.7	840.9	863.7	858.6	854.4

All	pt/ft3	Dev. from mean
Mean	841.6	
Min Point	581.7	-30.9%
Max Point	963.0	14.4%

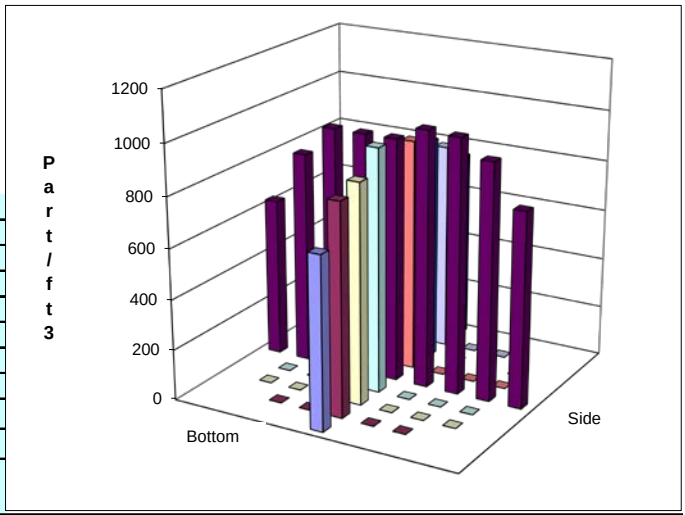
Center 2/3	Side	Bottom	All	Normlzd
Mean	880.7	894.0	887.3	924.23
Std. Dev.	53.2	55.6	52.7	62.79
COV as %	6.0	6.2	**5.9**	**6.79**

Avg Conc 831 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	2.3	2.3	psig
Stack Temp	37.9	42.0	F
Mean Velocity	2697	2654	afpm
Ambient pressure	29.6	29.5	inHg
Ambient humidity	39.7%	44.8%	RH
Ambient temp	15.8	14.3	C
Back-Gd aerosol	0,0,0,0,1	67,63,68,69,60	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	58	58	psig



Notes:

CA

2/2/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 2/2/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
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PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 62**
Date	2/3/2015	Fan configuration	**Fan A&B Max**
Tester	CA, EA	Fan Setting	**33** **Hz**
Stack Dia.	11.922 in.	Stack Temp	39.65 deg F
Stack X-Area	111.6 in.2	Start/End Time	906/1032
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I2**
		Damper Configuration	**Scale**

		Side				Bottom			
Order ----->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	574	511	512	532.3	700	738	652	696.7
2	1.25	602	650	724	658.7	908	902	829	879.7
3	2.31	653	721	696	690.0	997	944	996	979.0
4	3.85	706	754	743	734.3	926	887	896	903.0
Center	5.96	749	809	723	760.3	917	892	903	904.0
5	8.07	805	800	841	815.3	814	834	851	833.0
6	9.61	786	812	822	806.7	779	768	756	767.7
7	10.67	594	657	673	641.3	697	640	570	635.7
8	11.42	426	447	414	429.0	479	483	454	472.0
Averages ---------->		655.0	684.6	683.1	674.2	801.9	787.6	767.4	785.6

All	pt/ft3	Dev. from mean
Mean	729.9	
Min Point	429.0	-41.2%
Max Point	979.0	34.1%

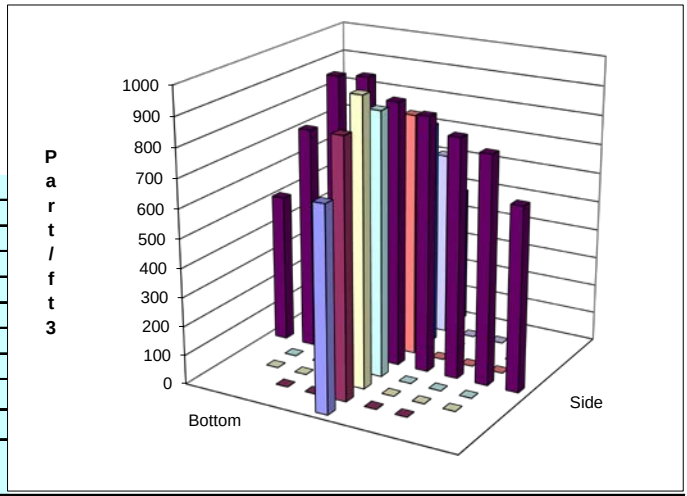
Center 2/3	Side	Bottom	All	Normlzd
Mean	729.5	843.1	786.3	855.26
Std. Dev.	69.1	112.5	107.3	95.46
COV as %	9.5	13.3	**13.6**	**11.16**

Avg Conc 717 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	2.0	2.0	psig
Stack Temp	39.6	39.7	F
Mean Velocity	2994	3063	afpm
Ambient pressure	29.6	29.6	inHg
Ambient humidity	42.5%	42.7%	RH
Ambient temp	17.0	16.6	C
Back-Gd aerosol	1,1,0,0,2	1,1,0,1,0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	50.0	57.5	psig



Notes:

CA

2/3/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 2/3/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 63**
Date	2/3/2015	Fan configuration	**Fan A&B Max**
Tester	CA, EA	Fan Setting	**33** **Hz**
Stack Dia.	11.922 in.	Stack Temp	40.55 deg F
Stack X-Area	111.6 in.2	Start/End Time	1040/1153
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I2**
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	593	531	572	565.3	720	767	765	750.7
2 1.25	765	709	695	723.0	1026	1033	1026	1028.3
3 2.31	761	802	777	780.0	1050	1063	1068	1060.3
4 3.85	811	816	830	819.0	1066	1116	1077	1086.3
Center 5.96	909	851	772	844.0	997	1012	995	1001.3
5 8.07	835	830	825	830.0	992	990	927	969.7
6 9.61	875	893	804	857.3	854	919	904	892.3
7 10.67	806	760	741	769.0	743	716	731	730.0
8 11.42	645	554	422	540.3	604	607	591	600.7
Averages ---------->	777.8	749.6	715.3	747.6	894.7	913.7	898.2	902.2

All	pt/ft3	Dev. from mean
Mean	824.9	
Min Point	540.3	-34.5%
Max Point	1086.3	31.7%

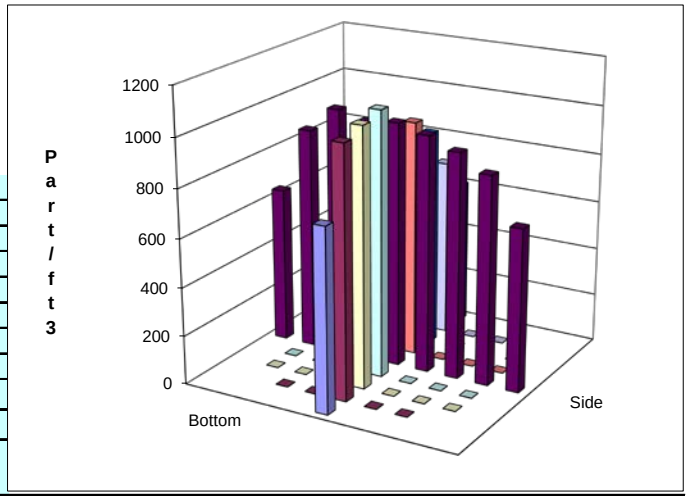
Center 2/3	Side	Bottom	All	Normlzd
Mean	803.2	966.9	885.0	959.91
Std. Dev.	47.8	122.2	123.1	91.83
COV as %	5.9	12.6	**13.9**	**9.57**

Avg Conc 813 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	2.0	2.0	psig
Stack Temp	39.7	41.4	F
Mean Velocity	3063	3037	afpm
Ambient pressure	29.6	29.6	inHg
Ambient humidity	42.7%	45.0%	RH
Ambient temp	16.6	15.8	C
Back-Gd aerosol	1,1,0,1,0	2,0,1,1,0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	57.5	57.5	psig



Notes: Start data is the same as finish data for PT62

CA
2/3/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 2/3/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 64**
Date	2/5/2015	Fan configuration	**Fan A&B Max**
Tester	CA, EA	Fan Setting	**33** **Hz**
Stack Dia.	11.922 in.	Stack Temp	44.95 deg F
Stack X-Area	111.6 in.2	Start/End Time	857/1023
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I2**
		Damper Configuration	**Scale**

Order ----->	2nd				1st			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	749	731	712	730.7	848	909	878	878.3
2 1.25	863	924	900	895.7	1067	1111	1128	1102.0
3 2.31	922	937	974	944.3	1185	1156	1213	1184.7
4 3.85	1024	1012	955	997.0	1136	1190	1224	1183.3
Center 5.96	964	1065	1013	1014.0	1098	1102	1173	1124.3
5 8.07	1083	1056	998	1045.7	1089	1048	1108	1081.7
6 9.61	1001	1060	987	1016.0	962	1029	1007	999.3
7 10.67	842	821	773	812.0	783	857	829	823.0
8 11.42	592	524	529	548.3	656	644	663	654.3
Averages ---------->	893.3	903.3	871.2	889.3	980.4	1005.1	1024.8	1003.4

All	pt/ft3	Dev. from mean
Mean	946.4	
Min Point	548.3	-42.1%
Max Point	1184.7	25.2%

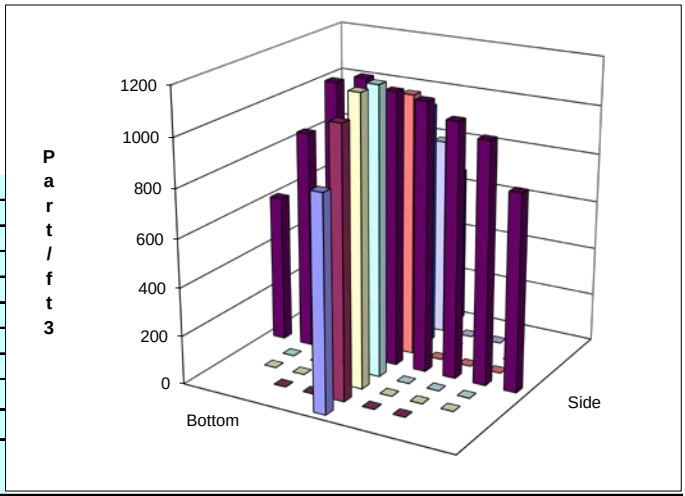
Center 2/3	Side	Bottom	All	Normlzd
Mean	960.7	1071.2	1015.9	1068.19
Std. Dev.	82.7	126.6	117.6	106.22
COV as %	8.6	11.8	**11.6**	**9.94**

Avg Conc 931 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	2.0	2.0	psig
Stack Temp	43.4	46.5	F
Mean Velocity	3073	3059	afpm
Ambient pressure	29.3	29.3	inHg
Ambient humidity	35.4%	38.1%	RH
Ambient temp	19.5	19.7	C
Back-Gd aerosol	3,0,0,1,1	2,3,0,1,1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	57.0	57.0	psig



Notes:

CA

2/5/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 2/5/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 65**
Date	2/5/2015	Fan configuration	**Fan A&B Min**
Tester	CA, EA	Fan Setting	**19** **Hz**
Stack Dia.	11.922 in.	Stack Temp	53 deg F
Stack X-Area	111.6 in.2	Start/End Time	1400/1545
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I2**
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	560	539	568	555.7	628	701	640	656.3
2 1.25	630	590	565	595.0	703	702	751	718.7
3 2.31	684	605	608	632.3	713	684	738	711.7
4 3.85	689	675	668	677.3	749	721	732	734.0
Center 5.96	684	680	690	684.7	703	712	721	712.0
5 8.07	818	680	661	719.7	676	728	700	701.3
6 9.61	703	697	714	704.7	786	665	653	701.3
7 10.67	791	746	761	766.0	665	629	649	647.7
8 11.42	729	692	708	709.7	630	624	609	621.0
Averages ---------->	698.7	656.0	660.3	671.7	694.8	685.1	688.1	689.3

All	pt/ft3	Dev. from mean
Mean	680.5	
Min Point	555.7	-18.3%
Max Point	766.0	12.6%

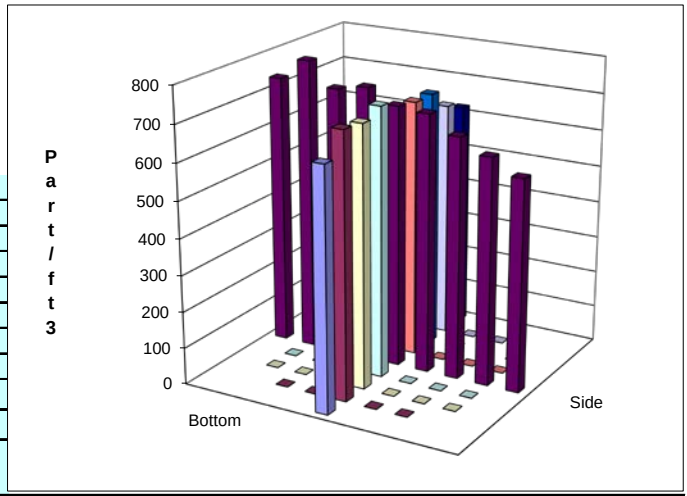
Center 2/3	Side	Bottom	All	Normlzd
Mean	682.8	703.8	693.3	706.94
Std. Dev.	56.3	27.2	43.9	44.00
COV as %	8.3	3.9	**6.3**	**6.22**

Avg Conc 678 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	1.2	1.2	psig
Stack Temp	55.2	50.8	F
Mean Velocity	1627	1625	afpm
Ambient pressure	29.2	29.2	inHg
Ambient humidity	41.9%	50.1%	RH
Ambient temp	19.2	17.4	C
Back-Gd aerosol	0,0,1,0,0	1,4,1,0	pt/ft3
No. Bk-Gd samples	5	4	
Compressor output	50.0	58.0	psig



Notes:

CA

2/5/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 2/5/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 66**
Date	2/6/2015	Fan configuration	**Fan A&B Min**
Tester	CA, EA	Fan Setting	**19** **Hz**
Stack Dia.	11.922 in.	Stack Temp	55.45 deg F
Stack X-Area	111.6 in.2	Start/End Time	903/1043
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I2**
		Damper Configuration	**Scale**

Order ----->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	723	703	824	750.0	1049	1018	1000	1022.3
2	1.25	730	835	924	829.7	1139	1097	1111	1115.7
3	2.31	800	854	1003	885.7	1082	1171	1069	1107.3
4	3.85	739	861	1001	867.0	1101	1101	1103	1101.7
Center	5.96	786	865	979	876.7	1086	1054	1059	1066.3
5	8.07	786	882	1063	910.3	1003	1016	1002	1007.0
6	9.61	968	875	1100	981.0	993	1075	1036	1034.7
7	10.67	951	820	1042	937.7	1023	1069	957	1016.3
8	11.42	928	729	1072	909.7	923	905	933	920.3
Averages ---------->		823.4	824.9	1000.9	883.1	1044.3	1056.2	1030.0	1043.5

All	pt/ft3	Dev. from mean
Mean	963.3	
Min Point	750.0	-22.1%
Max Point	1115.7	15.8%

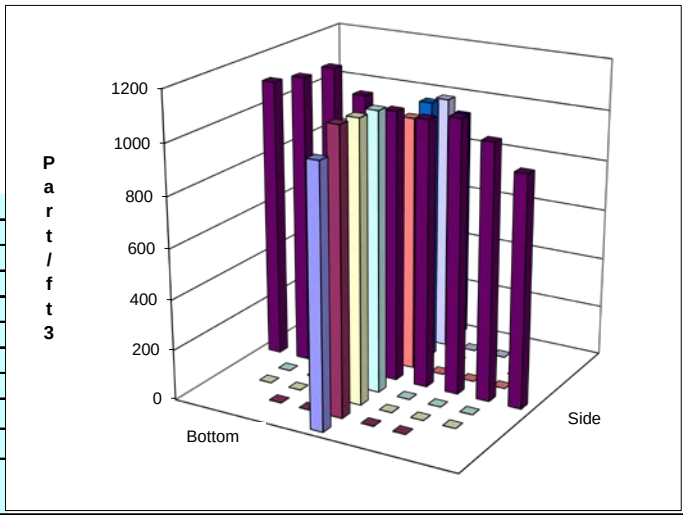
Center 2/3	Side	Bottom	All	Normlzd
Mean	898.3	1064.1	981.2	1078.39
Std. Dev.	49.8	45.4	97.5	53.47
COV as %	5.5	4.3	**9.9**	**4.96**

Avg Conc 962 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	1.3	1.3	psig
Stack Temp	54.9	56	F
Mean Velocity	1610	1675	afpm
Ambient pressure	29.07	29.07	inHg
Ambient humidity	38.2%	32.3%	RH
Ambient temp	20.9	23.7	C
Back-Gd aerosol	11,9,9,11,14	20,19,15,16,10	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	50.0	54.0	psig



Notes: The 3 traverse side - the compressor was not turn on.

CA

2/6/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 2/6/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
Signature on file in TI-WTPSP-138

PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 67**
Date	2/9/2015	Fan configuration	**Fan A&B Min**
Tester	CA, EA	Fan Setting	**19** **Hz**
Stack Dia.	11.922 in.	Stack Temp	50.55 deg F
Stack X-Area	111.6 in.2	Start/End Time	930/1120
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I2**
		Damper Configuration	**Scale**

Order ----->		2nd				1st				
Traverse-->		Side				Bottom				
Trial ---->		1	2	3	Mean	1	2	3	Mean	
Point	Depth, in.	particles/ft3				particles/ft3				
1	0.50	627	874	831	777.3	969	1028	998	998.3	
2	1.25	909	966	950	941.7	1086	1095	1071	1084.0	
3	2.31	926	941	1037	968.0	1177	1105	1210	1164.0	
4	3.85	967	1049	1027	1014.3	1163	1112	1101	1125.3	
Center	5.96	1002	1018	1070	1030.0	1053	1154	1050	1085.7	
5	8.07	1028	1042	1000	1023.3	956	1006	986	982.7	
6	9.61	950	995	926	957.0	951	943	948	947.3	
7	10.67	859	912	876	882.3	889	865	836	863.3	
8	11.42	826	830	768	808.0	808	868	774	816.7	
Averages ---------->		899.3	958.6	942.8	933.6	1005.8	1019.6	997.1	1007.5	

All	pt/ft3	Dev. from mean
Mean	970.5	
Min Point	777.3	-19.9%
Max Point	1164.0	19.9%

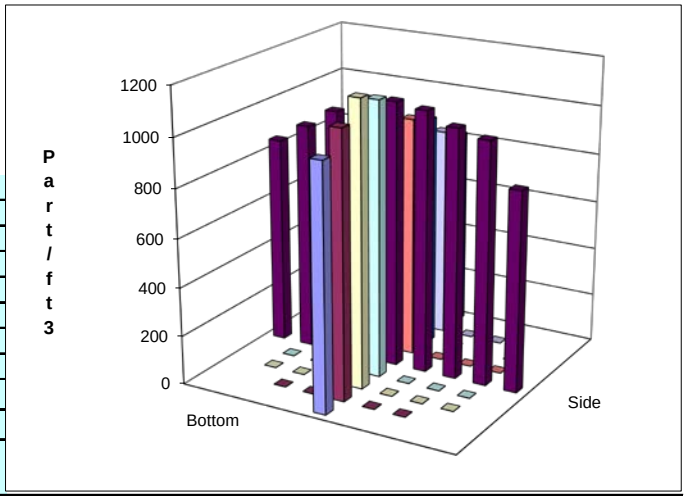
Center 2/3	Side	Bottom	All	Normlzd
Mean	973.8	1036.0	1004.9	1031.24
Std. Dev.	53.2	107.7	87.8	82.66
COV as %	5.5	10.4	**8.7**	**8.02**

Avg Conc 960 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	1.3	1.3	psig
Stack Temp	50.6	50.5	F
Mean Velocity	1645	1603	afpm
Ambient pressure	29.34	29.35	inHg
Ambient humidity	43.2%	45.3%	RH
Ambient temp	20.3	20.7	C
Back-Gd aerosol	0,0,0,0,0	0,0,0,0,1	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	50.0	58.0	psig



Notes:

CA

2/9/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 2/9/2015
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Technical Data Review performed by: Julia Flaherty
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PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 68**
Date	2/17/2015	Fan configuration	**Fan B Max**
Tester	CA, EA	Fan Setting	**59** **Hz**
Stack Dia.	11.922 in.	Stack Temp	46.7 deg F
Stack X-Area	111.6 in.2	Start/End Time	850/1020
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->	2nd				1st			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	568	580	517	555.0	733	727	653	704.3
2 1.25	637	577	646	620.0	710	690	693	697.7
3 2.31	673	690	698	687.0	796	748	670	738.0
4 3.85	730	666	761	719.0	856	807	757	806.7
Center 5.96	719	793	774	762.0	772	789	810	790.3
5 8.07	667	721	780	722.7	828	782	845	818.3
6 9.61	794	685	600	693.0	745	755	758	752.7
7 10.67	737	837	864	812.7	715	665	679	686.3
8 11.42	416	470	579	488.3	505	440	459	468.0
Averages ---------->	660.1	668.8	691.0	673.3	740.0	711.4	702.7	718.0

All	pt/ft3	Dev. from mean
Mean	695.7	
Min Point	468.0	-32.7%
Max Point	818.3	17.6%

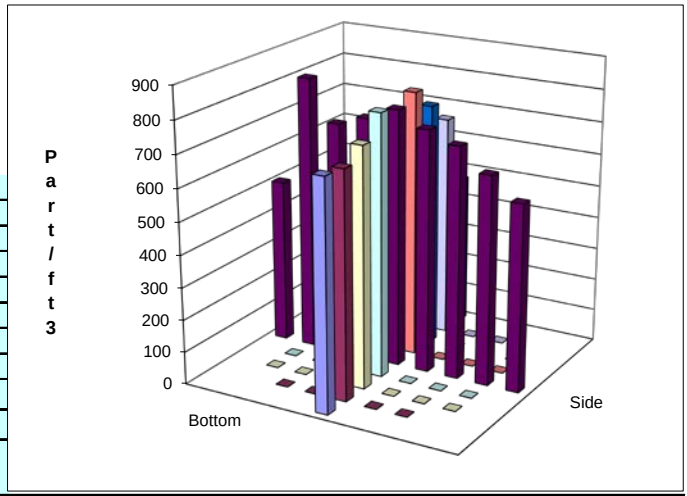
Center 2/3	Side	Bottom	All	Normlzd
Mean	716.6	755.7	736.2	749.49
Std. Dev.	60.7	52.0	58.0	55.84
COV as %	8.5	6.9	**7.9**	**7.45**

Avg Conc 686 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	41.9	51.5	F
Mean Velocity	3061	3021	afpm
Ambient pressure	29.91	29.88	inHg
Ambient humidity	38.9%	32.1%	RH
Ambient temp	14.5	16.3	C
Back-Gd aerosol	1,1,4,0,3	3,2,1,2,2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	50.0	60.0	psig



Notes:

CA

2/17/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
Signature/date 2/17/2015
Signature on file with Original

Technical Data Review performed by: Julia Flaherty
Signature/date 5/5/2015
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PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 69**
Date	2/18/2015	Fan configuration	**Fan B Max**
Tester	CA, EA	Fan Setting	**60** **Hz**
Stack Dia.	11.922 in.	Stack Temp	44.25 deg F
Stack X-Area	111.6 in.2	Start/End Time	843/1012
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->	2nd				1st			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	571	631	540	580.7	715	639	663	672.3
2 1.25	640	729	669	679.3	770	790	829	796.3
3 2.31	763	775	733	757.0	780	816	811	802.3
4 3.85	799	773	799	790.3	902	946	901	916.3
Center 5.96	839	846	829	838.0	988	954	976	972.7
5 8.07	883	832	952	889.0	957	980	967	968.0
6 9.61	776	780	850	802.0	966	910	883	919.7
7 10.67	666	593	949	736.0	868	769	788	808.3
8 11.42	478	323	757	519.3	587	557	535	559.7
Averages ---------->	712.8	698.0	786.4	732.4	837.0	817.9	817.0	824.0

All	pt/ft3	Dev. from mean
Mean	778.2	
Min Point	519.3	-33.3%
Max Point	972.7	25.0%

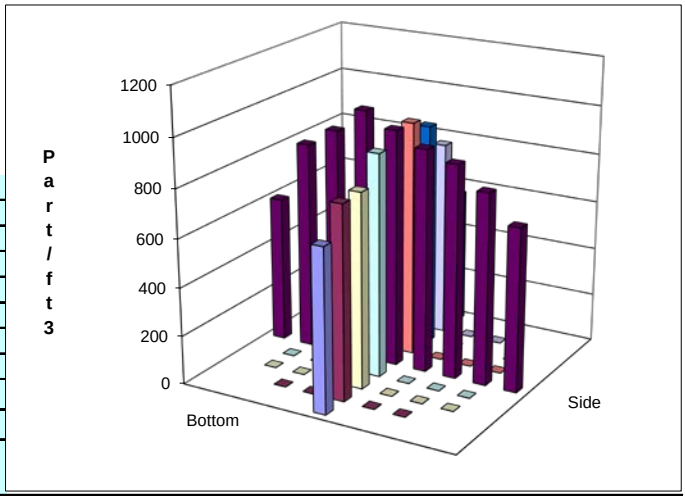
Center 2/3	Side	Bottom	All	Normlzd
Mean	784.5	883.4	834.0	896.99
Std. Dev.	68.7	78.9	87.6	77.47
COV as %	8.8	8.9	**10.5**	**8.64**

Avg Conc 762 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	40.4	48.1	F
Mean Velocity	3106	3089	afpm
Ambient pressure	29.8	29.8	inHg
Ambient humidity	28.0%	34.2%	RH
Ambient temp	19.2	16.3	C
Back-Gd aerosol	2,7,7,5,3	0,2,2,2,0	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	50.0	60.0	psig



Notes:

CA

2/18/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
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Technical Data Review performed by: Julia Flaherty
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PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 70**
Date	2/19/2015	Fan configuration	**Fan B Max**
Tester	CA, EA	Fan Setting	**60** **Hz**
Stack Dia.	11.922 in.	Stack Temp	53 deg F
Stack X-Area	111.6 in.2	Start/End Time	842/1012
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->		2nd				1st			
Traverse-->		Side				Bottom			
Trial ---->		1	2	3	Mean	1	2	3	Mean
Point	Depth, in.	particles/ft3				particles/ft3			
1	0.50	576	613	647	612.0	698	668	735	700.3
2	1.25	617	742	722	693.7	755	768	759	760.7
3	2.31	689	789	822	766.7	784	808	855	815.7
4	3.85	808	883	957	882.7	832	878	895	868.3
Center	5.96	919	1094	1017	1010.0	955	998	1028	993.7
5	8.07	972	1038	1068	1026.0	902	981	1087	990.0
6	9.61	1013	1098	1068	1059.7	925	978	997	966.7
7	10.67	1050	1111	921	1027.3	828	842	949	873.0
8	11.42	977	653	955	861.7	642	662	649	651.0
Averages ---------->		846.8	891.2	908.6	882.2	813.4	842.6	883.8	846.6

All	pt/ft3	Dev. from mean
Mean	864.4	
Min Point	612.0	-29.2%
Max Point	1059.7	22.6%

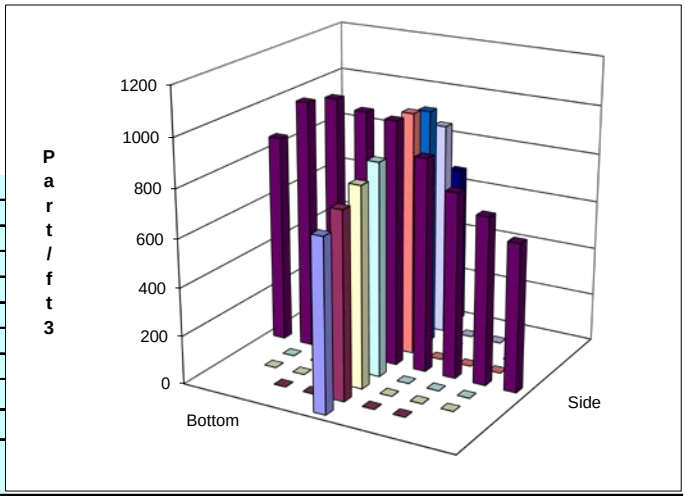
Center 2/3	Side	Bottom	All	Normlzd
Mean	923.7	895.4	909.6	916.93
Std. Dev.	145.1	90.8	117.2	117.05
COV as %	15.7	10.1	**12.9**	**12.77**

Avg Conc 847 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	48.1	57.9	F
Mean Velocity	3184	3122	afpm
Ambient pressure	29.77	29.76	inHg
Ambient humidity	36.1%	28.5%	RH
Ambient temp	18.0	20.7	C
Back-Gd aerosol	2,2,2,2,0	3,1,0,2,2	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	58	60	psig



Notes:

CA

2/19/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
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PARTICLE TRACER TRAVERSE DATA FORM

Site	**LV-C2 Remedial Stack Model**	Run No.	**PT- 71**
Date	2/19/2015	Fan configuration	**Fan B Max**
Tester	CA, EA	Fan Setting	**60** **Hz**
Stack Dia.	11.922 in.	Stack Temp	60.95 deg F
Stack X-Area	111.6 in.2	Start/End Time	1015/1125
Test Port	1	Center 2/3 from	1.09 to: 10.83
Distance to disturbance	119.88 inches	Points in Center 2/3	2 to: 7
Measurement units	particles/ft3	Injection Point	**I3**
		Damper Configuration	**Scale**

Order ----->	1st				2nd			
Traverse-->	Side				Bottom			
Trial ---->	1	2	3	Mean	1	2	3	Mean
Point / Depth, in.	particles/ft3				particles/ft3			
1 0.50	717	717	765	733.0	921	1027	909	952.3
2 1.25	863	753	791	802.3	1092	1116	1068	1092.0
3 2.31	921	894	877	897.3	1168	1197	1131	1165.3
4 3.85	960	902	952	938.0	1332	1188	1259	1259.7
Center 5.96	1065	1041	1049	1051.7	1364	1390	1326	1360.0
5 8.07	1050	1022	1146	1072.7	1461	1394	1394	1416.3
6 9.61	977	995	1113	1028.3	1366	1318	1306	1330.0
7 10.67	974	1010	1120	1034.7	1183	1151	1186	1173.3
8 11.42	773	744	790	769.0	997	936	911	948.0
Averages ---------->	922.2	897.6	955.9	925.2	1209.3	1190.8	1165.6	1188.6

All	pt/ft3	Dev. from mean
Mean	1056.9	
Min Point	733.0	-30.6%
Max Point	1416.3	34.0%

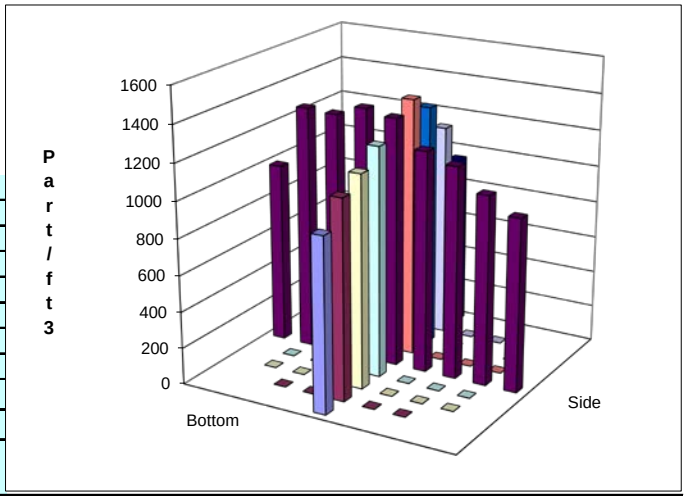
Center 2/3	Side	Bottom	All	Normlzd
Mean	975.0	1256.7	1115.8	1258.76
Std. Dev.	99.2	118.3	179.9	118.56
COV as %	10.2	9.4	**16.1**	**9.42**

Avg Conc 1038 pt/ft3

Instuments Used:

			Cal. Due
TSI VelociCalc	T95351203001		8/15/2015
Fisher Scientific Traceable Hygro/Therm/Bar		122277883	8/7/2015
Met One OPC	1011529010	ref	9/12/2015
Met One OPC	1011529009	sample	9/12/2015
NA			

	Start	Finish	
Generator Inlet Press	3.0	3.0	psig
Stack Temp	57.9	64.0	F
Mean Velocity	3184	3105	afpm
Ambient pressure	29.76	29.76	inHg
Ambient humidity	28.5%	41.6%	RH
Ambient temp	20.7	15.8	C
Back-Gd aerosol	3,1,0,2,2	2,4,4,1,7	pt/ft3
No. Bk-Gd samples	5	5	
Compressor output	60	60	psig



Notes: We used the finish data from PT-70 as the start data for PT-71/not temp, not velocity.

CA
2/19/2015

Oil Used: Edwards + Fisher 19

Ref. Probe Location:

Probe Type / Configuration: L-Shape probe

Entries made by: Carmen Arimescu
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