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Process Test Evaluation Report Waste Retrieval Sluicing System Emissions Collection (Phase I, II and III)

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Abstract: This Process Test Report was written to summarize all the activities that have occurred during the VOC data collection tests.

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PROCESS TEST EVALUATION REPORT
WASTE RETRIEVAL SLUICING SYSTEM EMISSIONS COLLECTION
(PHASE I, PHASE II, AND PHASE III)

November 1999

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EXECUTIVE SUMMARY

During sluicing of the first batch of sludge from tank 241-C-106 on November 18, 1998, an unexpected high concentration of volatile organic compounds was measured in the 296-C-006 ventilation stack. Eleven workers reported irritation related symptoms and were sent to Hanford Environmental Health Foundation (HEHF) and Kadlec Hospital for medical evaluations. No residual health effects were reported.

As a result of the unexpectedly high concentrations of volatile organic compounds encountered during this November sluicing event, a phased process test designed to characterize the emission constituents was conducted on December 16, 1998, March 7, 1999, and March 28, 1999.

The primary focus of this evaluation was to obtain samples of the 296-C-006 ventilation stack effluent and surrounding areas at elevated levels of volatile organic compounds initiated by sluicing. Characterization of the emission constituents was necessary to establish appropriate procedural and administrative exposure controls for continued sluicing. Additionally, this information would be used to evaluate the need for engineered equipment to mitigate any further potential chemical stack emissions.

This evaluation confirms that the following actions taken during Phase I, Phase II, and Phase III of the Waste Retrieval Sluicing System Emissions Collection Process Test were conservative and appropriate for continued sluicing:

- Implement stack limit of 500 ppm volatile organic compounds, with lower administrative limits
- Ensure worker involvement through enhanced planning
- Continue using the existing fenced boundary location
- Continue using pressure demand fresh air respiratory protection inside the C-Farm as recommended by Industrial Hygiene
- Continue using the existing respiratory protection/ take cover requirements outside the C-Farm boundary as recommended by Industrial Hygiene
- Continue using existing anti-contamination clothing
- Minimize the number of workers exposed to emissions
- Maintain the number of workers exposed to emissions
- Maintain the current stack height
- Maintain the current 2 ppm volatile organic compound direct reading instrument administrative level
- Evaluate the use of a chemical stack filter for future sluicing evolutions on other tanks
- Continue to evaluate more sensitive monitoring equipment
- Consider the use of in-line monitoring equipment for future sluicing evolution on other tanks

A more detailed and conclusive evaluation performed by an independent Industrial Hygiene Evaluation Team is documented in *HNF-4167, Hazard Characterization and Exposure Control Strategy for Tank 241-C-106 Sluicing Process.*

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1.0 INTRODUCTION

During sluicing of the first batch of sludge from tank 241-C-106 on November 18, 1998, an unexpected high concentration of volatile organic compounds was measured in the 296-C-006 ventilation stack. Eleven workers reported irritation related symptoms and were sent to HEHF and Kadlec Hospital for medical evaluations. No residual health effects were reported.

With the documented concurrence of the Department of Energy, Richland (DOE-RL) and Washington Department of Ecology (WDOE), expanded sampling and characterization of gaseous emissions from tank 241-C-106 were conducted during controlled sluicing in three separate phases of a process test. The test phases were conducted on December 16, 1998 (Phase I), March 7, 1999 (Phase II), and March 28, 1999 (Phase III).

Characterization of the emission constituents was necessary to establish appropriate procedural and administrative exposure controls for continued sluicing and to evaluate the need for engineered equipment to mitigate any further potential chemical stack emissions.

This process test evaluation report the results and basic exposure control conclusions documented in *HNF-4167, Hazard Characterization and Exposure Control Strategy for Tank 241-C-106 Sluicing,* specifically relating to process control of the Waste Retrieval Sluicing System. The information in *HNF-4167, Hazard Characterization and Exposure Control Strategy for Tank 241-C-106 Sluicing* is used to evaluate the effectiveness of existing hazard controls, establish recommendations for future sampling, and recommend control strategies for future sluicing activities.

2.0 BACKGROUND

This section provides background information on the implementation of the Waste Retrieval Sluicing System (WRSS) at tank 241-C-106 and the unexpected VOC concentrations observed during initial sluicing operations at tank 241-C-106 prior to conducting the process test.

2.1 Tank 241-C-106 Waste Retrieval Sluicing System

Tank 241-C-106 has been selected to demonstrate the sluicing technique as a retrieval technology for single-shell tank waste. The WRSS was installed on single-shell tank 241-C-106 by Project W-320. The purpose of this system is to retrieve and transfer high-heat sludge from tank 241-C-106 to double-shell tank 241-AY-102, which is designed for high-heat waste storage. The waste transfer will eliminate the high-heat safety issue for tank 241-C-106 and demonstrate a technology for retrieval of single-shell tank waste. Implementation of the WRSS will complete the U.S. Department of Energy, Richland Operations Office commitments to the *Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1996). This commitment is also

captured in Tri-Party Agreement Milestone M-45-03A, Initiate Sluicing Retrieval of 241-C-106, which states "initiating sluicing retrieval of tank 241-C-106 to resolve the high-heat issue and demonstrate waste retrieval."

2.2 L-PHMC-1998-0141, Occurrence Report: 296-C-006 Stack Exceeded Volatile Organic Compound (VOC) Limit, November 19, 1998

Sluicing operations at tank 241-C-106 commenced November 18, 1998 for the first batch of Campaign 1. Baseline VOC emissions readings were obtained and monitored using Industrial Hygiene and Safety (IH&S) field instrumentation during active sluicing per Process Memo #2E98-018, *WRSS - Guidance for Industrial Health Sampling,* and Job Control System (JCS) work package 2E-98-1711, *241-C Perform VOC Measurements W-320 Exhaust Skid.* Additionally, personal and area samples for subsequent organic and ammonia exposure analyses were collected and field screening was performed in the immediate work area. During sluicing of this first batch of sludge from tank 241-C-106, an unexpected high VOC concentration was measured in the 296-C-006 ventilation stack. Approximately 450 ppm VOC was observed approximately one and one half hours after the start of sluicing, exceeding the established air discharge permit concentration of 50 ppm VOC. (DOE/RL-95-62, *Non-radioactive Air Emissions Notice of Construction Project W-320, 241-C-106 Tank Sluicing,* Revision 1).

WRSS operations were immediately halted and actions were taken to establish a respiratory protection zone in accordance with HNF-SD-WM-HSP-002, *Tank Farm Health and Safety Plan.* Limited stack and grab sampling was performed during the event to collect breathing zone samples. Although preliminary field analytical results of the personal and area samples indicated no detectable ammonia or organic vapor concentrations, these breathing zone samples were inconclusive. Several workers reported an acrid smell. Subsequently eleven workers were admitted to HEHF for medical evaluations following this event, with no residual health effects reported.

Several employee health concerns were appropriately addressed and the necessity for additional stack emission and monitoring controls was identified as a result of this event. It was concluded that further characterization of the emission constituents was necessary to establish appropriate procedural and administrative controls and/or to evaluate the need for and design adequate equipment to mitigate any further potential chemical stack emissions. The main objective was to provide a safe work environment for the employees.

3.0 WRSS EMISSIONS COLLECTION PROCESS TEST

A process test is defined in HNF-IP-0842, TWRS Administrative Control Manual, Volume IV, Engineering, Section 4.7, *Process Tests*, as "a controlled change in the process operating parameters for the purpose of evaluating potential improvements, developing optimum process parameters, or establishing new criteria." The WRSS Emissions Collection Process Test involved the collection of various vapor samples while instituting a controlled sluice system operation approach that gradually increased gaseous emissions in tank 241-C-106 at a controlled rate. The controlled sluice system approach was implemented based on previous sluicing experience and results generated during each phase of the process test.

Improved samples were obtained in the 296-C-006 ventilation stack and surrounding areas while implementing conservative personnel exclusion area controls, additional respiratory protection equipment, a modified stack environmental release limit of 500 parts per million (ppm) Volatile Organic Compound (VOC), and an administrative worker exposure limit of 100 ppm VOC.

3.1 WRSS Process Test Objectives

The main objective of the WRSS emissions collection process test was to safely obtain analytical data to be used to further define existing hazards associated with the 296-C-006 ventilation system stack emissions during active sluicing of tank 241-C-106. This information would be used to evaluate the effectiveness of existing hazard controls, establish recommendations for future sampling and control strategies, and to evaluate the need for engineered equipment to mitigate any further potential chemical stack emissions.

In general, the process test was conducted in which the pumps in tank 241-C-106 and tank 241-AY-102 were intermittently operated and various vapor samples obtained to determine constituents that may be present during active sluicing of tank 241-C-106. Specifically, these vapor samples were obtained from the 296-C-006 ventilation system stack, 241-AZ-702 ventilation system stack, and tank 241-AY-102 head space via the standard hydrogen monitoring system (SHMS). The analytical results are used to address the following characterization objectives:

- Provide gas composition data that can be used to determine personnel protective measures
- Provide gas composition data that can be used for control equipment selection and design
- Substantiate that ammonia and organic emissions are below regulatory thresholds during the test.

3.2 WRSS Process Test Criteria

In accordance with HNF-IP-0842, TWRS Administrative Control Manual, Volume IV, Engineering, Section 4.7, Process Tests, a process test plan was generated to provide an overview of the process test, including the objective, testing outline, test requirements, safety and operational concerns, and testing evaluation criteria. A process test plan was issued for each of the three phases of the process test as follows:

- HNF-3733, Rev. 0, Process Test Plan: Waste Retrieval Sluicing System Emissions Collection
- HNF-4034, Rev.0, Process Test Plan, Phase II: Waste Retrieval Sluicing System Emissions Collection
- HNF-4034, Rev. 1, Process Test Plan, Phase III: Waste Retrieval Sluicing System Emissions Collection.

Sampling and analysis plans were generated to identify additional characterization objectives pertaining to specific sampling, collection, laboratory analytical evaluation, and reporting requirements for the proposed vapor samples obtained to address emission issues related to the sluicing of tank 241-C-106. A sampling and analysis plan was also issued for each phase of the process test as follows:

- HNF-3732, Waste Retrieval Sluicing System Vapor Sampling and Analysis Plan for Evaluation of Organic Emissions
- HNF-4030, Waste Retrieval Sluicing System Vapor Sampling and Analysis Plan for Evaluation of Organic Emissions, Process Test Phase II
- HNF-4212, Waste Retrieval Sluicing System Vapor Sampling and Analysis Plan for Evaluation of Organic Emissions, Process Test Phase III.

The analytical requirements identified in these sampling and analysis plans include those specified in *Request for Ecology Concurrence on Draft Strategy/Path Forward to Address Concerns Regarding Organic Emissions from C-106 Sluicing Activities.*

In addition to the sampling and analysis plans, an *IH Sampling/Monitoring Strategy for C-106 sluicing Test Run* was also developed for monitoring and sampling the breathing zones around tank 241-C-106 and the 296-C-006 stack and the breathing zones around tank 241-AY-102 and the 241-AZ-702 ventilation system.

All perceivable personnel and process precautions and criteria were considered and implemented as practical during the process test. HNF-SD-WM-PCP-013, *Tank 241-C-106 Waste Retrieval Sluicing System Process Control Plan*, establishes the controls necessary for typical sluice system operations. Specifically, HNF-SD-WM-PCP-013, consolidates the technical operating requirements and criteria (i.e., primary mass transfer, temperature, flammable gas) for typical sluicing operations and provides overall technical guidance for the retrieval activity. These

controls are incorporated into applicable WRSS Plant Operating Procedures and Alarm Response Procedures.

The process test plans utilized HNF-SD-WM-PCP-013 in its entirety for continued active operation of the WRSS during the process test. The process test plans augment the Process Control Plan with additional guidance and controls necessary to obtain the emission characterization data and to further quantify the stack emissions as detailed in the Sampling and Analysis Plans. These controls assemble the necessary testing methods with a graded sluicing approach to ensure the test objectives are achieved in a safe and controlled manner.

PTP-320-001, *Waste Retrieval Sluicing System Emissions Collection Process Test*, provided guidance during the process test in which Volatile Organic Compounds levels in the 296-C-006 ventilation system effluent were increased. Applicable limits and controls identified in the process test plans and derived from HNF-SD-WM-PCP-013 were incorporated into this test procedure as the implementing document. A process test procedure was generated for each phase of the process test (Appendix A).

The process criteria and specification limits by which this test was measured are those strictly associated with ensuring that tank 241-C-106, tank 241-AY-102, and the WRSS are maintained in a safe configuration during the WRSS Emissions Collection Process Test. For this process test, safety-related parameters include waste and dome space temperatures, leak detection, tank pressure, flammable gas generation, SHMS operability, and ventilation system operability -- all of which are addressed by HNF-SD-WM-PCP-013, *Tank 241-C-106 Waste Retrieval Sluicing System Process Control Plan*. The process criteria, specification limits, required monitoring frequencies, and reporting requirements for these safety-related parameters adhere to the requirements contained in authorization basis documentation, administrative controls, operating specification document requirements, and Flammable Gas Advisory Board reports applicable to Tank 241-C-106, 241-AY-102, and the 241-AZ-702 ventilation system.

3.3 Conduct of WRSS Process Test

The waste retrieval sluicing system was operated in accordance with the process test plan and process test procedure to raise the total organic carbon concentration in the 296-C-006 ventilation stack to approximately 100 parts per million by volume (ppmv) and allow vapor samples to be taken. The Waste Retrieval Sluicing System was operated in a controlled manner to achieve increased levels of VOCs. Control of the VOCs levels incrementally increased via several methods as dictated in the test procedure. These methods included operating the WRSS within tighter parameters than those identified for normal sluicing operations, receiving constant feedback from WRSS Process Engineering on VOC trend data, and stabilizing the VOC levels via aiming the sluicer nozzle to a fixed point and reducing the speed of the P-0622 booster pump.

The governing process test procedure and supporting routine operating procedures TO-320-005 and TO-320-006 were performed in conjunction to control and perform WRSS operations and VOC sampling activities at the exhaust stacks associated with tanks 241-C-106 and tank 241-AY-102. TO-320-005 coordinated interaction between WRSS Process Engineering and WRSS Operations to ensure and document performance of major pre-requisite activities such as completion of the Batch Control Record, start-up of required support systems, and removal of administrative locks on the WRSS pumps. Once these items were completed the user was directed to specific sections of operating procedure TO-320-006 to perform the actual system operation. WRSS Sampling activities as identified in the Sample Analysis Plans (SAPs) were performed in accordance with specific supporting Job Control System Work at prescribed locations and intervals. Upon completion of the process test, or shutdown for any reason, the user was returned to procedure TO-320-005 and the test procedure to perform specific post process test activities such as reinstallation of administrative locks and data collection and evaluation. As mentioned earlier, the SAPS provided the general methodology and procedures to be used in the preparation, retrieval, transport, analysis, and reporting of results from vapor samples retrieved during the process test.

The tank 241-AY-102 sluice submersible pump was run to transfer liquid from tank 241-AY-102 to tank 241-C-106. The tank 241-C-106 slurry submersible pump and booster pump were then operated simultaneously. These three pumps were operated continuously and the tank 241-AY-102 booster pump was operated intermittently to raise the TOC concentration. Samples were taken prior to pump startup, during initial operation of the tank 241-AY-102 sluice submersible pump, during intermittent operation of the tank 241-AY-102 booster pump, and after all pumps were shut down.

In general, only essential personnel with prescribed Personal Protective Equipment (PPE) for their role and location were permitted to conduct the Process Test. Training was verified as current. All test participants attended a pre-job meeting to verify knowledge of the known hazards. The opportunity was given to voice concerns; resolutions of those concerns were addressed before the process test commenced.

Access to the 241-C Tank Farm area and support buildings (i.e. MO-211 and 241-C Tank Farm change trailers) were limited to essential personnel as established by WRSS Management. Barricaded access points were established at all access roads and perimeter roads. No vehicular traffic was permitted within the fenced area of 241-C Tank Farm during the Process Test without the approval of the Test Director.

Additionally, communications were established to inform personnel of progressive activities during the process test. Other required communications included all employee site messages, announcements at 200 E tailgate meetings, and Private Automatic Exchange (PAX)/radio announcements. All essential personnel maintained continuous access to 2-way radios.

The results of each phase of the process test are presented in the following sections.

3.3.1 WRSS Process Test Phase 1: WRSS Emissions Collection

HNF-3733, *Process Test Plan: Waste Retrieval Sluicing System Emissions Collection*, HNF-3732, *Waste Retrieval Sluicing System Vapor Sampling and Analysis Plan for Evaluation of Organic Emissions*, and the associated process test procedure PTP-320-001, Rev. A-1, *Process Test Procedure: Waste Retrieval Sluicing System Emissions Collection*, were implemented on December 16, 1998. Using conservative personnel exclusion area controls, respiratory protection equipment, a stack environmental release limit of 500 ppm VOC, and worker exposure administrative level of 100 ppm VOC, improved samples were collected in the stack and in the surrounding areas. A maximum stack VOC concentration of 34 ppm was measured as depicted in the Figure 1. Unfortunately, the process test was stopped after a few minutes of sluicing due to a leak in the supernate jumper in the sluice pit at tank 241-C-106. Although limited sample data obtained during the initial phase of the process test was analyzed, the need for further samples collected at higher waste agitation and VOC emission levels remained necessary.

3.3.2 Process Test Phase II: WRSS Emissions Collection

HNF-4034, Rev. 0, *Process Test Plan: Waste Retrieval Sluicing System Emissions Collection Phase II*, HNF-4030, *Waste Retrieval Sluicing System Vapor Sampling and Analysis Plan for Evaluation of Organic Emissions*, and the associated process test procedure PTP-320-001, Rev. A-2, *Process Test Procedure: Waste Retrieval Sluicing System Emissions Collection*, were implemented on March 7, 1999. Using previously established exclusion area controls, respiratory protection equipment, a stack environmental release limit of 500 ppm VOC, and worker exposure administrative level of 100 ppm VOC, additional samples were collected in the stack and in the surrounding areas. A maximum stack VOC concentration of 234 ppm was measured as depicted in the figure 2.

3.3.3 Process Test Phase III: WRSS Emissions Collection

HNF-4034, Rev. 1, *Process Test Plan: Process Test Plan, Phase III: Waste Retrieval Sluicing System Emissions Collection*, HNF-4212, *Waste Retrieval Sluicing System Vapor Sampling and Analysis Plan for Evaluation of Organic Emissions Phase III*, and the associated process test procedure PTP-320-001, Rev. A-4, *Process Test Procedure: Waste Retrieval Sluicing System Emissions Collection*, were implemented on March 28, 1999. Using previously established exclusion controls and modified sluicing control parameters, a final set of samples were collected in the stack and in the surrounding areas. A maximum stack VOC concentration of 132 ppm was measured as depicted in the figure 3.

4.0 WRSS PROCESS TEST CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

There were three main engineering controls identified in *HNF-4167, Hazard Characterization and Exposure Control Strategy for Tank 241-C-106 Sluicing Process,* that were used to reduce employee exposures. These were to remove the 296-C-006 exhaust stack rain guard, raise the stack, and use process controls to control emissions. Another engineering control used was the establishment of remote monitoring capabilities. Each of these controls are discussed in detail in *HNF-4167, Hazard Characterization and Exposure Control Strategy for Tank 241-C-106 Sluicing Process.*

As related to this process test evaluation report, process controls were likely the major factor in minimizing employee exposures. All sluicing activities conducted under the process test were controlled by approved process control plans, process test plans, and other control procedures. Several changes were generated via these plans as a result of the November event. In December, the process test included turning on and shutting off the sluicing pumps in a manner to minimize emissions. In later phases of the process test the direction of the sluicing nozzle was controlled. The sluicing methods, particularly those associated with changing the nozzle direction were successful in controlling emissions below the administrative limits imposed during the process test.

To reduce the exposure potential for monitoring personnel, remote monitoring capabilities were tested in March and eventually implemented in later sluicing activities beyond the process test. This allowed the monitoring of stack Volatile Organic Compound concentrations from an area that required no respiratory protection.

Several administrative controls were also implemented successfully as documented in *HNF-4167, HNF-4167, Hazard Characterization and Exposure Control Strategy for Tank 241-C-106 Sluicing*. These included improved communication, air monitoring, maintaining access controls, and administrative air concentration control levels and limits recommended by Industrial Hygiene.

Personal protective equipment and the need for a chemical stack filter on the 296-C-006 stack during sluicing were also addressed in the independent Industrial Hygiene report. Based on the information provided in this independent report, respiratory protection requirements were substantially reduced and there was no need for a chemical stack filter on the 296-C-006 ventilation stack.

4.2 Recommendations

Future waste removal activities should anticipate high levels of VOCs being generated during waste retrieval operations. The lessons learned during this sluicing operation should be used to improve future design of equipment, procedures, and personnel training.

5.0 REFERENCES

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FIGURE 1
296-C-006 EXHAUST STACK ORGANIC EMISSIONS
WRSS PROCESS TEST PHASE I
(December 16, 1998)

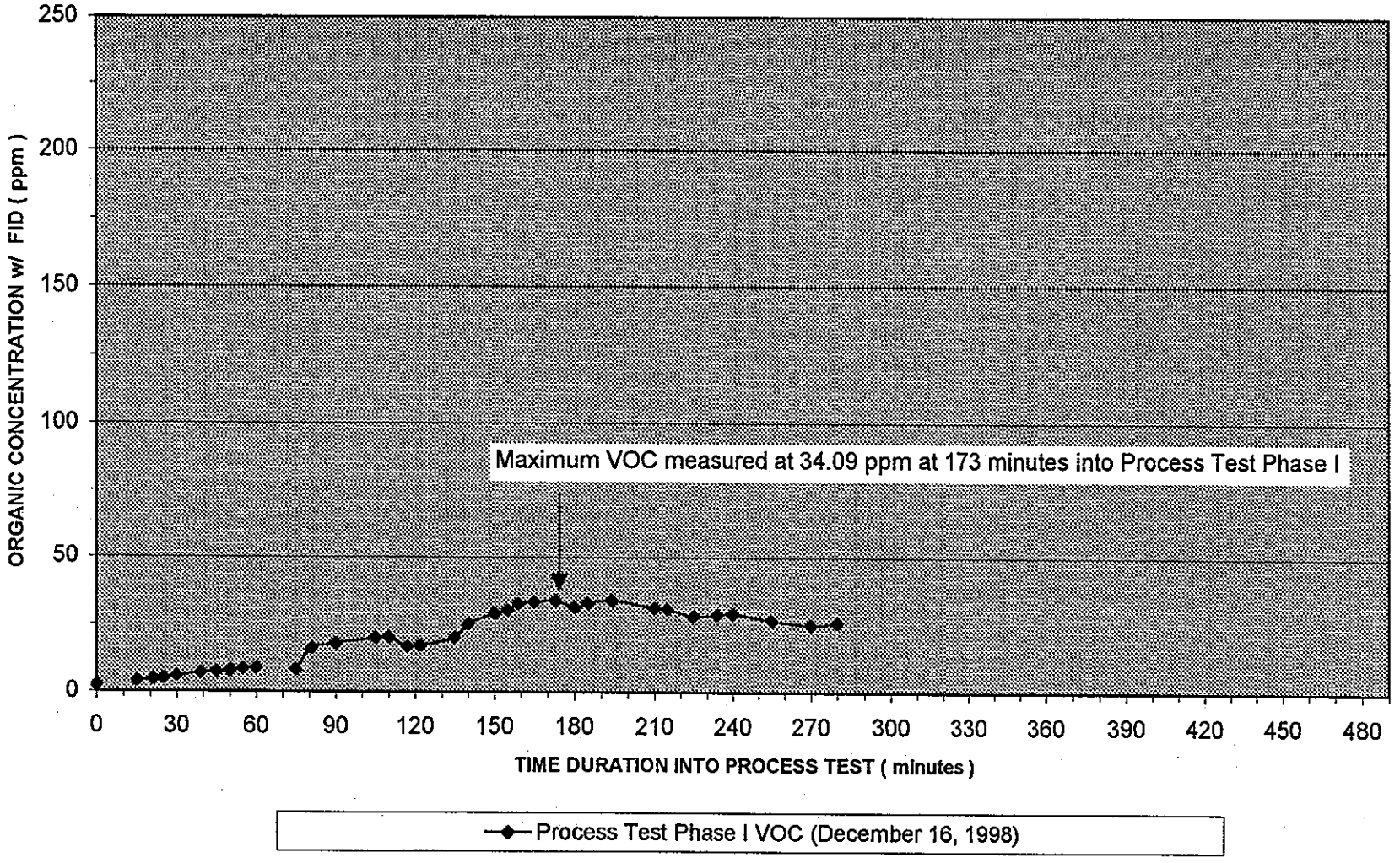

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FIGURE 2
296-C-006 EXHAUST STACK ORGANIC EMISSIONS
WRSS PROCESS TEST PHASE II
(March 7, 1999)

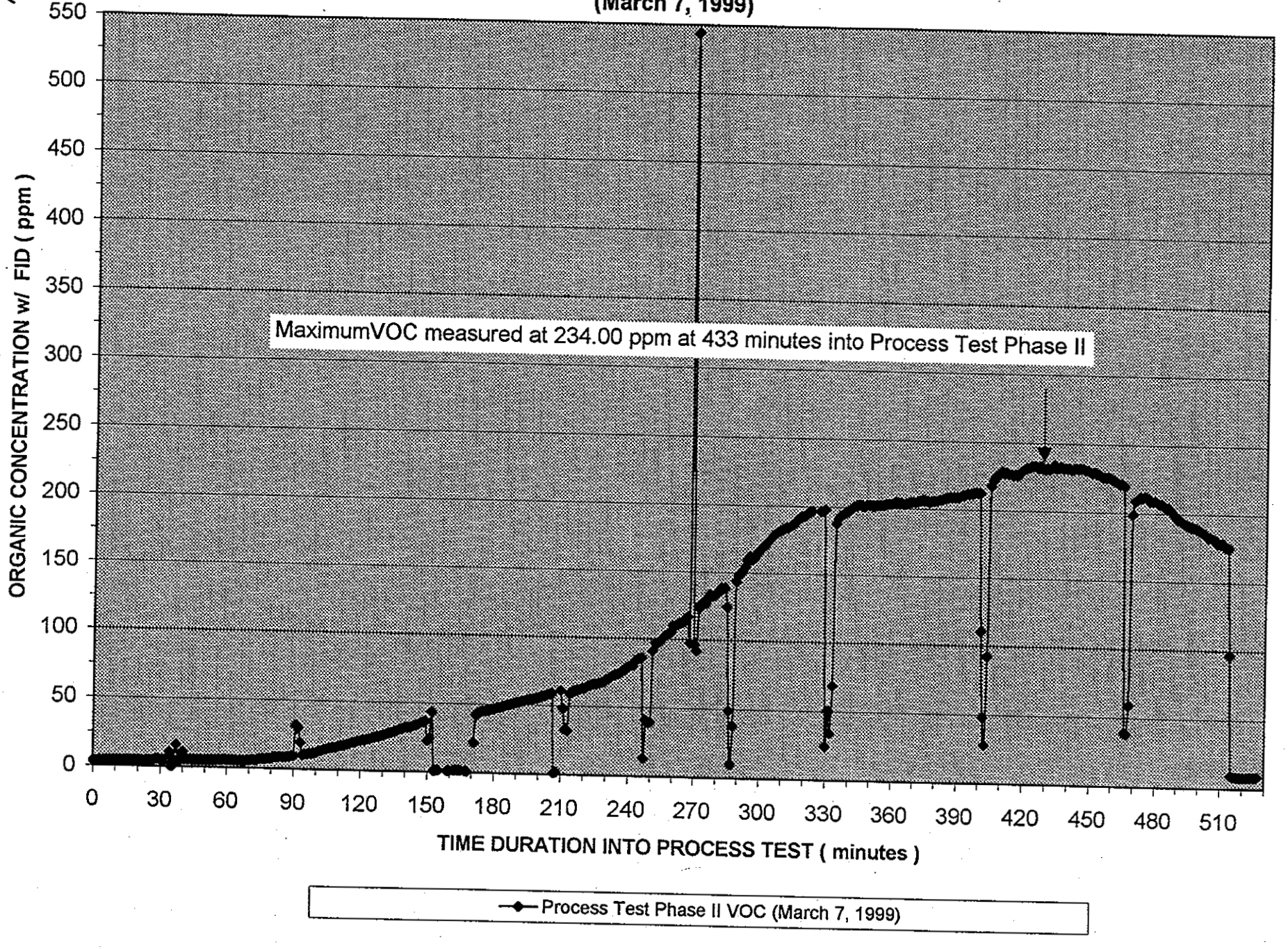

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FIGURE 3
296-C-006 EXHAUST STACK ORGANIC EMISSIONS
WRSS PROCESS TEST PHASE III
(March 28, 1999)

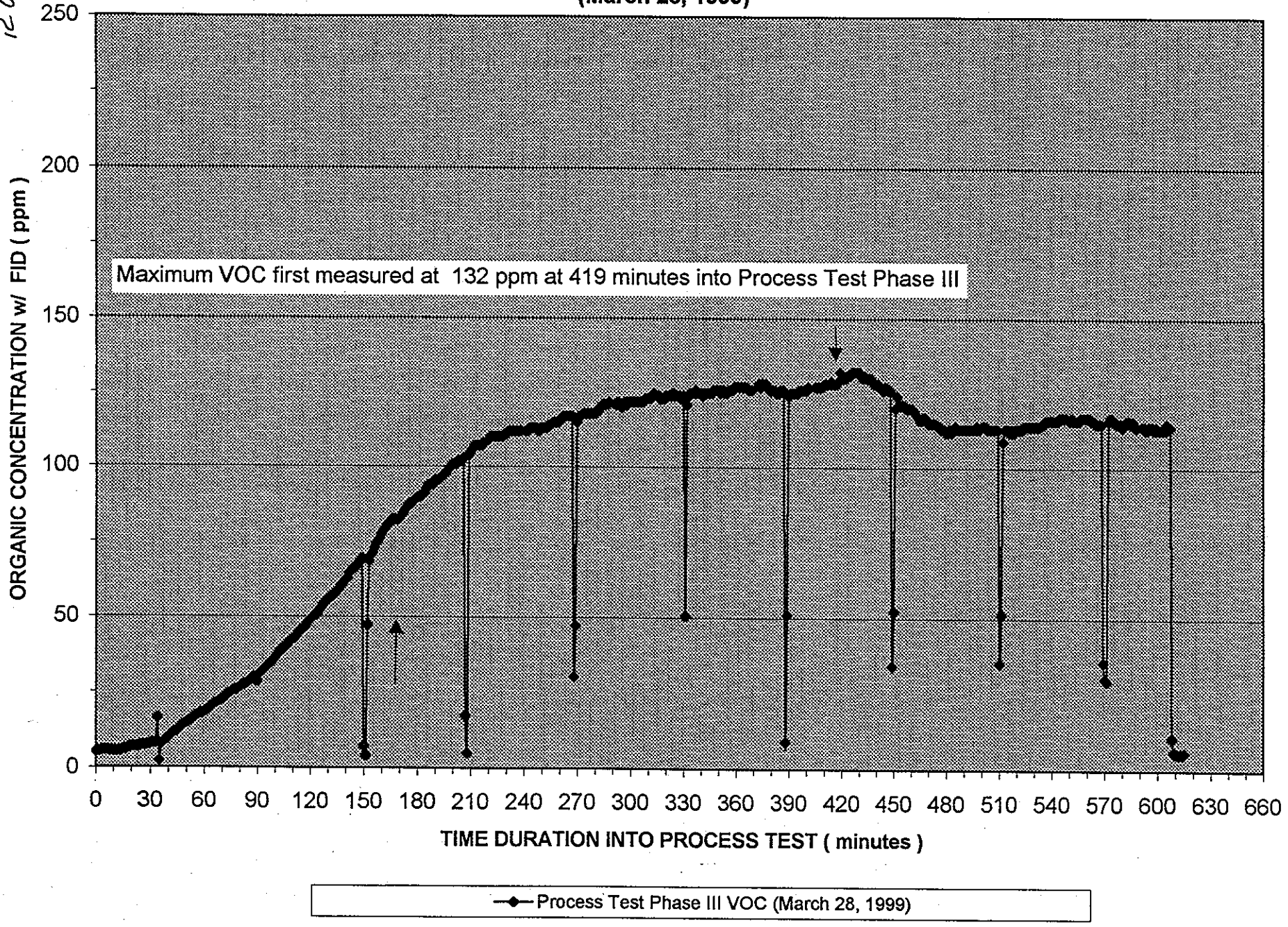

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Figure 4

296-C-006 EXHAUST VOC EMISSIONS AND SOLIDS LOADING
WRSS PROCESS TEST PHASE II
(March 7, 1999)

RPP-4743 R0

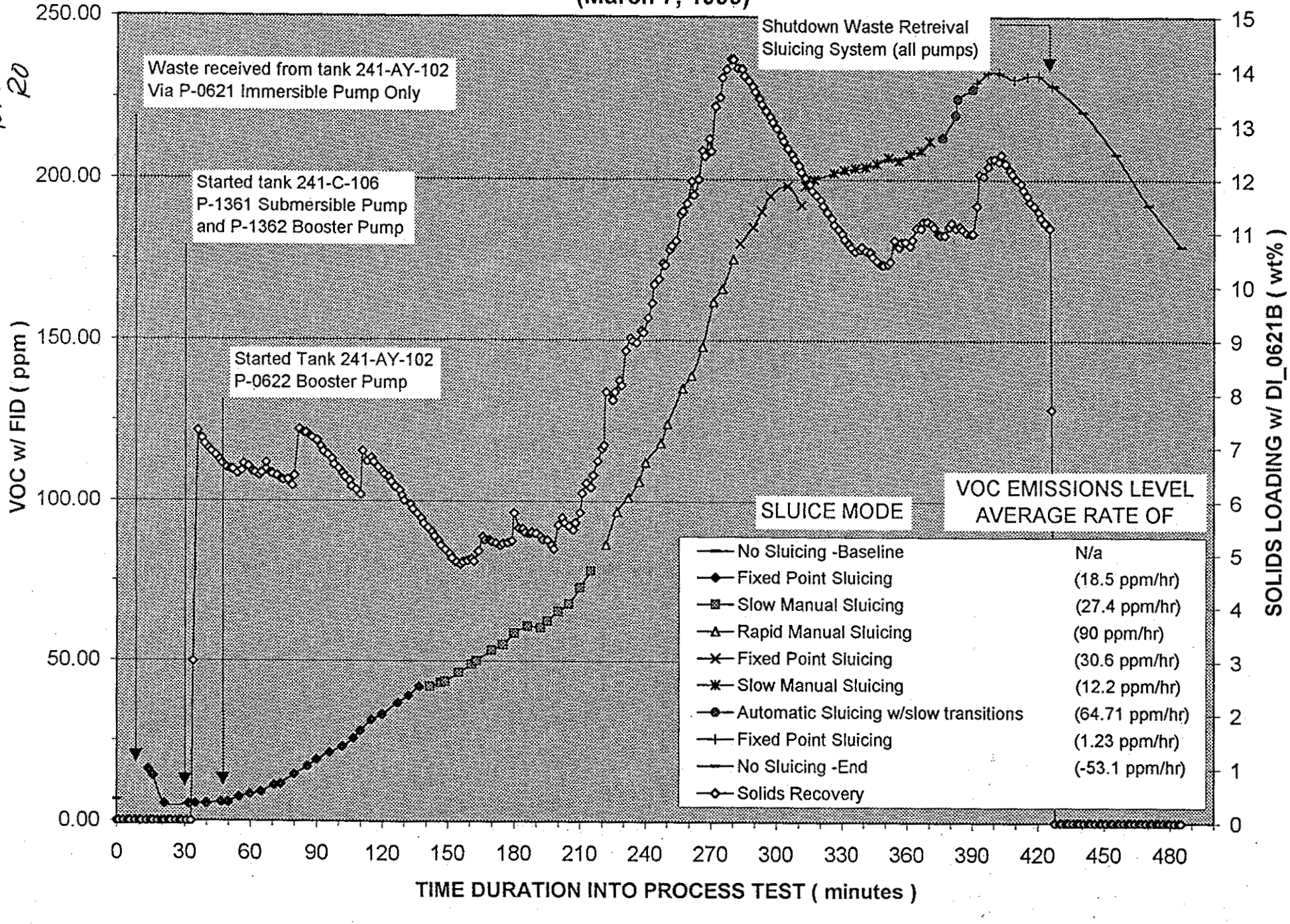

Figure 5

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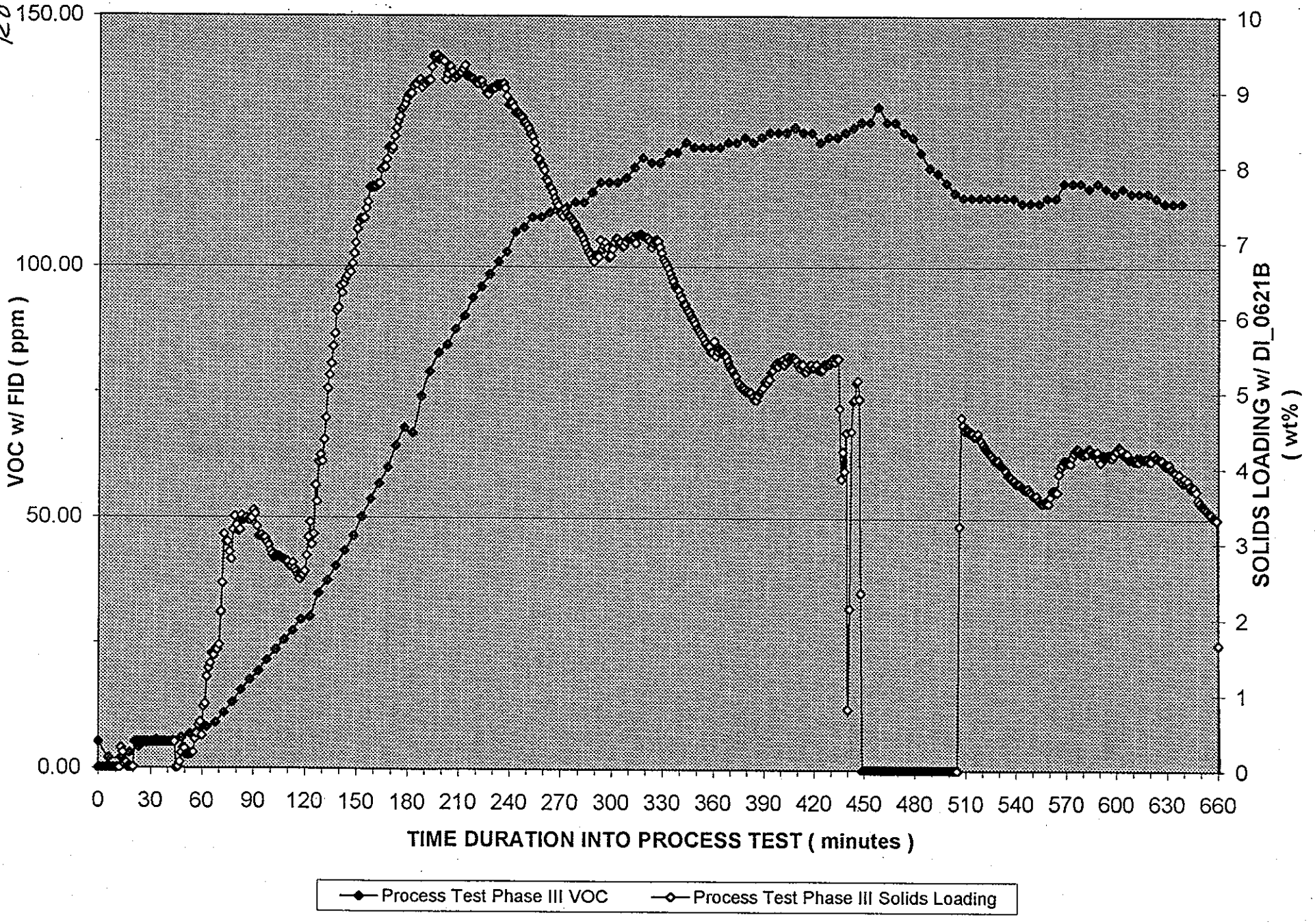
296-C-006 EXHAUST VOC EMISSIONS AND SOLIDS LOADING
WRSS PROCESS TEST PHASE III
(March 28, 1999)



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APPENDICES

Appendix A: WRSS Process Test Procedures

1) PTP-320-001, Rev. A-0 (unable to locate document)

2) W-320 Logbook Notes, Phase I (page A1 and A2)

3) PTP-320-001, Rev. A-Z (pages A3 through A26)

4) W-320 Logbook Notes, Phase II (pages A27 through A32)

5) PTP-320-001, Rev. A-4 (pages A33 through A58)

6) W-320 Logbook Notes, Phase III (pages A59 through A64)

12-16-98 con't

1653 Started AY Submersible pump

1659 Started C Farm Submerable pump

1702 Started Sluce baster pump at C Farm

1711 Started Slurry baster pump at AY Farm

1715 Received Tank 241-C-106 Sluice Pit 06C leak detected (LDA-1368A)

1715 Shut down C-Farm submersible pump and Booster Pump, also AY Farm Shut down their submersible and booster Pumps.

1717 006 exhauster Flow rate 310, PPM 30.5

1717 HPT's started surveys around cover blocks.

1721 Operator C-1 reset leak detector

1731 30 PPM and steady for 5 minutes out of 006 exhauster

1731 HPT's reported 3 MR/HR around 06C sluice pit this is no change from pre-sluicing levels.

LATE ENTRY 1716 Shift mgr notified of leak detector and we were in ARP for proper response.

1745 Dale Allen gave permission to continue with testing.

1826 Started AY Submersible pump

1830 Started C Farm Submersible pump

1833 Recieved tank 241-C 106 leak detected (LDA 1368A)

1834 Shutdown all Pumps AY ~~and~~ SLS C Farm

1841 Shutdown pumps at C Farm Submersible and ~~Slurry~~ SLS Booster.

1910 Started Submersible pump at C Farm

1911 Started booster pump at C Farm

1932 Shutdown Submersible and booster pumps

(A-1)

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1653 Started AY Submersable pump
1659 Started C Farm Submerable pump
1702 Started Sluce baster pump at C Farm
1711 Started Slurry baster pump at AY Farm
1715 Received Tank 241-C-106 Sluice Pit 06C leak detected (LDA-1368A)
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1745 Dale Allen gave permission to continue with testing.
1826 Started AY Submersable pump
1830 Started C Farm Submersible pump
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1834 Shutdown all Pumps AY ~~and~~ SLS C Farm
1841 Shutdown pumps at C Farm Submersible and ~~Slurry~~ SLS Booster.
1910 Started Submersible pump at C Farm
1911 Started booster pump at C Farm
1932 Shutdown Submersible and booster pumps
1943 Raised wich to upper limit

PROCESS TEST PROCEDURE PHASE II: WASTE RETRIEVAL SLUICING SYSTEM EMISSIONS COLLECTION

Current Modification: A-2

USQ Screening Number: TF-98-1248, Rev 1

Approval Designator: ES

PCA Incorporated: ETF-99-175

POSITION/ORG	DELEGATE	DATE
LNCO/WRSS	C.W. Peake	03/03/99
ENG/TWRS Safety	L.E. Thomas	03/04/99
MGR/WRSS	J.E. Andrews	03/03/99
TWRS Env	T.A. Dillhoff	03/03/99
Cog/WRSS Eng	J.M. Jones	03/03/99
Procedure Writer	W.G. Cox	03/04/99
Approval Authority	K.J. Anderson	03/04/99

Pages Affected	Summary of Change	Reason for Change
Page 1; Title	Modified title to identify this as PHASE II of the process test	Process Test Phase II to collect additional samples. This facilitates operation of the Waste Retrieval Sluicing System.
Page 4; Table of Contents based on heading and section changes	Generated new table of content headings based on changes to sections and applicable heading titles throughout the procedure	
Page 5; Step 1.1	Changed total to volatile throughout the procedure when referring to organic compounds; and Inserted text to emphasize that the intent is to control VOC emissions throughout process test	
Page 5; Step 1.2	Updated supporting JCS Work Package listings	
Page 6: Steps 2.2.1 & 2.2.3	Clarified process engineering and nuclear chemical operator responsibilities	

Page 6; Steps 2.2.5 and 2.2.7	Updated supporting JCS Work Package listings	
Page 6; Steps 2.2.8 and 2.3	Updated Reference documents which include supporting JCS work packages, test plans, and sampling analysis plans.	
Page 8; Step 2.4.1	Established new duration limit for phase II of the process test based on WRSS engineering and deleted cog engineer approval (cog is member of JTRG)	
Page 8; Step 2.4.3	Inserted text to emphasize that the intenet is to control VOC emissions throughout process test	
Page 9; Step 3.3	Added Second bullet for notification to ECO for exceeding 50 ppm NOC limit at 241-AZ-702 exhaust stack	
Page 10; Step 3.4	Established new action limits and actions for phase II of the process test based on WRSS engineering and IH recommendations and lessons learned	
Page 11; Step 4.2	Updated performance documents which include supporting JCS work packages, test plans, and sampling analysis plans.	
Page 12; New Step	Inserted prerequisite to contact meterological station for weather forecast	
Page 13; Step 5.1.1, 5.1.3, 5.1.5, & 5.1.6	Updated supporting JCS work package references and procedural work step references due to PCAs to those supporting procedures	
Page 14; Inserted new step prior to step 5.2.1.2	Established new action limit and actions based on WRSS Engineering and IH recommendations and lessons learned	
Page 14; Steps 5.2.1 and 5.2.1.2	Clarified action statements and established new action limits and actions based on WRSS Engineering and IH recommendations and lessons learned	
Page 14; Inserted new step and limits prior to step 5.2.1.3	Established new action limit and actions based on WRSS Engineering and IH recommendations and lessons learned	
Page 14; Step 5.2.1.3	Updated supporting JCS work package references and procedural work step references due to PCAs to those supporting procedures	

Page 14; Inserted new steps and notes prior to Step 5.2.1.4	Established new notes and procedural steps based on WRSS Engineering and IH recommendations and lessons learned	
Page 14; Step 5.2.1.4	Added secondary procedure step for recording operation time and VOCs ppm	
Page 14; Inserted new steps after step 5.2.1.4	Added option to control recirculation heater operation	
Page 15; Inserted New section prior to 5.3	Inserted new section providing instructions for stabilizing volatile organic emissions	
Pages 16 and 17; Sections 5.3 and 5.4	Established new action limits and actions for phase II of the process test based on WRSS engineering and IH recommendations and lessons learned and inserted notes as necessary for clarification	
Pages 19 through 21	Modified Table 1, Modified Table 2, Added Data Sheet 1, and Added Data Sheet 2 to facilitate operations during PHASE II of the process test and make them consistent with newly established limits and modes of operation	

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1.0 PURPOSE AND SCOPE

1.1 PURPOSE

This procedure provides guidance during a process test in which Volatile Organic Compounds levels will be increased in the 296-C-006 ventilation system effluent. The Waste Retrieval Sluicing System will be operated in a controlled manner to achieve increased levels of Volatile Organic Compounds. Control of the Volatile Organic Compound levels will be controlled throughout this process test evolution via several methods as dictated in this procedure. These methods include operating the Waste Retrieval Sluicing System within tighter parameters than those identified for normal sluicing operations, receiving constant feedback from Waste Retrieval Sluicing System Process Engineering on Volatile Organic Compound trend data, and stabilizing the Volatile Organic Compound levels via aiming the sluicer nozzle to a fixed point, reducing the speed of the P-0622 booster pump, etc.

1.2 SCOPE

This governing process test procedure and supporting routine operating procedures TO-320-005 and TO-320-006 are performed in conjunction to control and perform Waste Retrieval Sluicing System operations and Volatile Organic Compound sampling activities at the exhaust stacks associated with tanks 241-C-106 and tank 241-AY-102. TO-320-005 coordinates interaction between Waste Retrieval Sluicing System Process Engineering and Waste Retrieval Sluicing System Operations to ensure and document performance of major pre-requisite activities such as completion of the Batch Control Record, start-up of required support systems, and removal of administrative locks on the Waste Retrieval Sluicing System pumps. Once these items are complete the user is directed to specific sections of operating procedure TO-320-006 to perform the actual system operation. Waste Retrieval Vapor Sampling activities will be performed in accordance with Job Control System Work Packages ES-99-00053, ES-99-00054, ES-99-00055, 2E-99-00143 and 2E-99-00144, at prescribed locations and intervals. Upon completion of the process test, or shutdown for any reason, the user is returned to procedure TO-320-005 and this test procedure to perform specific post process test activities such as reinstallation of administrative locks and data collection and evaluation.

2.0 INFORMATION

2.1 TERMS AND DEFINITIONS

Volatile Organic Compound - As used in this procedure means a measure of the total concentration of airborne organic (carbon based) compounds being released by agitation of tank waste during Waste Retrieval Sluicing System operation.

2.2 RESPONSIBILITIES

2.2.1 Process Engineering:

- Responsible for providing process engineering support to Waste Retrieval Sluicing System operations as identified in procedures TO-320-005, TO-320-006, and this procedure.

2.2.2 Waste Retrieval Sluicing System Operations Engineer:

- Certified Operations Engineer will act as the Test Director and is responsible for start-up and supervision of all field activities, ensuring and documenting that prerequisite conditions are met, and coordinating activities among the various organizations as identified in this test procedure and procedures TO-320-005 and TO-320-006.

2.2.3 Nuclear Chemical Operators:

- Responsible for verification, documentation, and performance of process test activities as described in procedures TO-320-005, TO-320-006, and this procedure.

2.2.4 Health Physics Technicians:

- Responsible for performing pre-established radiological surveys and recommending radiological controls and actions to the Test Director as described in procedures TO-320-005 and TO-320-006.

2.2.5 Industrial Hygiene Technicians:

- Responsible for performing pre-established stack, area, and personal sampling during the process test as described in Job Control System Work Packages ES-99-00054, ES-99-00055, 2E-99-00143 and 2E-99-00144. Additional sampling will be performed as directed by the Industrial Hygienist.

2.2.6 Industrial Hygienist:

- Responsible for providing Industrial Hygiene support to Waste Retrieval Sluicing System operations as identified in the TANK FARM HEALTH AND SAFETY PLAN, HNF-WM-SD-HSP-002.

2.2 RESPONSIBILITIES (Cont.)

2.2.7 Characterization Project Operations:

- Responsible for the installation of sampling tubes at 296-C-006 stack as described in Job Control System Work Package ES-99-00053 and collection of pre-established SUMMA canister and particulate filter samples at the 296-C-006 and 241-AZ-702 stacks during the process test as described in Job Control Work System Work Packages ES-99-00054 and ES-99-00055.

2.2.8 Special Analytical Support:

- Responsible for the collection of pre-established Triple Sorbent Trap, Sorbent Tube Train, and Polyurethane Foam samples during the process test as described in Job Control System Work Package 2E-99-143.

2.2.9 Waste Retrieval Sluicing System Cognizant Engineers:

- The Cognizant Engineer is responsible for providing technical assistance to Operations management and the Test Director throughout the performance of this process test.

2.2.10 Environmental Compliance Officer:

- The Environmental Compliance Officer is responsible for interfacing between State of Washington regulators and operations.

2.3 REFERENCES

- HNF-4034, Rev. 0, Waste Retrieval Sluicing System Emissions Collection Phase II
- HNF-4030, Waste Retrieval Sluicing System Vapor Sampling and Analysis Plan for Evaluation of Organic Emissions
- TO-320-005, WRSS Start-up and Process Control
- TO-320-006, TK-241-C-106 Waste Retrieval Sluicing System Sluicing Operations
- Job Control System Work Package ES-99-00053, Installation of the Sampling Tubes in the Stack at C-106
- Job Control System Work Package ES-99-00054, Vapor Sampling at AZ-702 Ventilation System
- Job Control System Work Package ES-99-00055, Vapor Sampling at C-106
- Job Control System Work Package 2E-99-00143, 296-C-006 TOC/VOC w/FID & OVM
- Job Control System Work Package 2E-99-00144, 241-AZ-702 Monitor VOC at AY/AZ Exh w/OVM

2.4 GENERAL INFORMATION

2.4.1 The process test is not to exceed a period of approximately 20 hours. If extension is requested, Joint Test Review Group approval must be obtained.

2.4.2 During the actual process test activities, operators and support crews must maintain a constant awareness of many parameters to prevent potential equipment damage and violation of associated Limiting Conditions of Operation, Technical Safety Requirements, and the analyzed safety envelope for the Waste Retrieval Sluicing System.

2.4.3 Control of the Volatile Organic Compound levels will be controlled throughout this process test evolution via several methods as dictated in this procedure. These methods include operating the Waste Retrieval Sluicing System within tighter parameters than those identified for normal sluicing operations, receiving constant feedback from Waste Retrieval Sluicing System Process Engineering on Volatile Organic Compound trend data, and stabilizing the Volatile Organic Compound levels via aiming the sluicer nozzle to a fixed point, reducing the speed of the P-0622 booster pump, etc.

2.5 RECORDS

2.5.1 The completed Working Copy of this process test procedure (including data sheets), TO-320-005, TO-320-006, and supporting sampling Job Control System work packages will be kept as permanent records.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 PERSONNEL SAFETY

The precautions and limitations as they pertain to personnel safety are identified in pre-approved procedures TO-320-005 and TO-320-006 and supporting Job Control system sampling work packages. In addition to those requirements listed in the referenced procedures, the following are applicable:

WARNING - Operation of the Waste Retrieval Sluicing System may create potentially elevated levels of volatile organic compounds in the 296-C-006 ventilation system effluent. Appropriate breathing air controls and actions will be directed by Industrial Hygiene for worker safety.

WARNING - Personnel must take cover or don self contained breathing apparatus if they must leave the MO-211 trailer while it is downwind of the 296-C-006 stack.

3.2 RADIATION AND CONTAMINATION CONTROL

The precautions and limitations as they pertain to radiation and contamination control are identified in pre-approved procedures TO-320-005 and TO-320-006 and supporting Job Control System sampling work packages. There are no additional radiation and contamination controls associated with this process test outside those already identified in the referenced procedures.

3.3 ENVIRONMENTAL COMPLIANCE

The precaution and limitations as they pertain to environmental compliance control are identified in pre-approved procedures TO-320-005 and TO-320-006. In addition to those requirements listed in the referenced procedures, the following is applicable:

- Environmental Operations Compliance must be notified in the event that volatile organic compound concentrations measured at the 296-C-006 Exhaust Stack exceeds 500 ppm as described in meeting minutes (REQUEST FOR ECOLOGY CONCURRENCE ON DRAFT STRATEGY/PATH FORWARD TO ADDRESS CONCERNS REGARDING ORGANIC EMISSIONS FROM C-106 SLUICING ACTIVITIES, December 3, 1998) approved by The Washington State Department of Ecology.

- Environmental Operations Compliance must be notified in the event that Volatile Organic Compound concentrations measured at the 241-AZ-702 exhaust stack exceeds 50 ppm as described in the Notice of Construction for that facility.

3.4 LIMITS

Limits as they pertain to Operational and Authorization Basis controls and requirements are identified in pre-approved procedures TO-320-005 and TO-320-006 and supporting Job Control System sampling work packages. In addition to those requirements listed in the referenced procedures, the following limits established for stabilizing the Volatile Organic Compound emissions from tank 241-C-106:

- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 300 ppm (3-minute average).

The following limits are established for routine shutdown of Waste Retrieval Sluicing System:

- Volatile Organic Compound concentrations measured by Organic Vapor Monitor at the 241-AZ-702 stack exceed 50 ppm (3-minute average).

- Process Test Duration Time of 20 hours (run time) is complete.

- Discretion of the Test Director.

3.4 LIMITS (CONT)

NOTE - Non-essential personnel are identified as those persons not responsible for safe-mode shutdown and restoration of the Waste Retrieval Sluicing System as defined by Operations Management.

The following limit is established for emergency shutdown of the Waste Retrieval Sluicing System and evacuation of all non-essential personnel in C Farm to the staging area at the Fluor Daniel Northwest All-Trades trailer/lunch room on Buffalo Avenue to await further instructions:

- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 400 ppm (3-minute average).

NOTE - Upon termination of the Process Test, an evaluation and approval from the Joint Test Review Group is required for restart of the Process Test.

The following limit is established for emergency shutdown of the Waste Retrieval Sluicing System, termination of the Process Test, and evacuation of all personnel in C Farm to the staging area at the Fluor Daniel Northwest All-Trades trailer/lunch room on Buffalo Avenue to await further instructions:

- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 500 ppm (3-minute average).

4.0 PREREQUISITES

4.1 SPECIAL TOOLS, EQUIPMENT AND SUPPLIES

Special tools, equipment, and supplies are identified in pre-approved procedures TO-320-005 and TO-320-006 and supporting sampling work packages.

4.2 PERFORMANCE DOCUMENTS

The following procedures and work packages will be needed to perform this procedure:

- TO-320-005, WRSS STARTUP AND PROCESS CONTROL
- TO-320-006, TK-241-C-106 Waste Retrieval Sluicing System Sluicing Operations
- Job Control System Work Package ES-99-00053, Installation of the Sampling Tubes in the Stack at C-106
- Job Control System Work Package ES-99-00054, Vapor Sampling at AZ-702 Ventilation System
- Job Control System Work Package ES-99-00055, Vapor Sampling at C-106
- Job Control System Work Package 2E-99-00143, 296-C-006 TOC/VOC w/FID & OVM
- Job Control System Work Package 2E-99-00144, 241-AZ-702 Monitor VOC at AY/AZ Exh w/OVM

4.3 CONDITIONS AND ACTIONS

The following conditions and actions must be completed prior to performing this procedure:

4.3.1 Sampling equipment and support structures are installed per Job Control System Work Package ES-99-00053, Installation of the Sampling Tubes in the Stack at C-106.

4.3.2 Obtain 8-hour forecast from Hanford Meteorological Station regarding wind direction, wind speed, atmospheric stability, etc., and discuss findings with Waste Retrieval Sluicing System Management.

4.3.3 Receipt of approval from Waste Retrieval Sluicing System Operations Engineer, Double Shell Tank Shift Manager, and Joint Test Review Group to proceed with readiness activities and process test.

_____ / 3-7-99
Test Director Signature Date

4.3.4 Conduct a PRE-JOB SAFETY MEETING with all personnel involved in performance of this process test.

- All work will be performed under Radiation Work Permit E-1116 or the specific Radiation Work Permit referenced in the sampling Work Package.

4.3.5 Performance of TO-320-005 through Step 5.2.1.

5.0 PROCEDURE

5.1 WASTE RETRIEVAL SLUICING SYSTEM READINESS

NOTE - Steps 5.1.1 through 5.1.5 of this procedure may be performed concurrently to facilitate operations.

5.1.1 **ENSURE** communications are **ESTABLISHED AND MAINTAINED** between MO-211, 241-AY-51, and remote vapor sampling crews.

5.1.2 **ENSURE** all C Farm change trailers (lower, middle, and upper) are unlocked to allow egress from the C Farm.

5.1.3 **ENSURE** baseline vapor sampling activities have commenced in accordance with Job Control System Work Packages ES-99-00054, ES-99-00055, 2E-99-00143, and 2E-99-00144.

5.1.4 **ENSURE** safety barricades are erected to prevent personnel not associated with the Process Test from entering C Farm process test area defined by the Double-Shell Tank Shift Manager and Test Director:

At a minimum barricades will be established at:

- Approximately 50 feet east of the intersection of Seventh and Eighth Streets on Eighth Street
- Approximately 50 feet west of the intersection of Eighth Street and Canton Avenue on Eighth Street
- Approximately 50 feet west of the intersection of the dirt road north of AN Farm and Canton Avenue on the dirt road
- Approximately 50 feet north of the intersection of Seventh Street and Buffalo Avenue on Buffalo Avenue.

5.1.5 **PERFORM** TO-320-006 through Section 5.1 AND Section 5.4 through Step 5.4.19, **AND RETURN** to step 5.1.6 of this procedure.

5.1.6 **ENSURE** baseline vapor sampling activities have been completed in accordance with Job Control System Work Packages ES-99-00054, ES-99-00055, 2E-99-00143, and 2E-99-00144 prior to the start of the Waste Retrieval Sluicing System.

5.2 WASTE RETRIEVAL SLUICING SYSTEM OPERATIONS AND EMISSIONS COLLECTION

WARNING

Operation of the Waste Retrieval Sluicing System may result in potentially elevated levels of Volatile Organic Compounds in the 296-C-006 ventilation system effluent. Appropriate breathing air controls and actions will be directed by Industrial Hygiene for worker safety.

5.2.1 **COMPLETE** TO-320-006, Sections 5.4 and 5.5 as directed by the Test Director with the following considerations:

5.2.1.1 **IF** MO-211 is downwind of stack (indicated by wind socks), **SHUT OFF** trailer ventilation and remain inside.

5.2.1.2 **IN ADDITION** to the conditions listed in TO-320-006, Section 5.4, **IF** any of the following conditions occur, **STABILIZE** Volatile Organic Compound emissions from tank 241-C-106 in accordance with Section 5.3 of this procedure:

- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 300 ppm (3-minute average).

5.2.1.3 **IN ADDITION** to the conditions listed in TO-320-006, Section 5.4, **IF** any of the following conditions occur, **PROCEED** to Section 5.5 of this procedure to perform routine shutdown of the Waste Retrieval Sluicing System:

- Volatile Organic Compound concentrations measured by Organic Vapor Monitor at the 241-AZ-702 exceed 50 ppm (3-minute average).
- Process Test Duration Time of 20 hours (run time) is complete. Start of the process test is defined as start of the 241-AY-102 Immersible Pump P-0621 (e.g., agitation of 241-C-106 waste).
- Discretion of the Test Director.

5.2.1.4 **IN ADDITION** to the conditions listed in TO-320-006, Section 5.4, **IF** any of the following conditions occur, **PROCEED** to Section 5.4 of this procedure to perform emergency shutdown of the Waste Retrieval Sluicing System:

- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 400 ppm (3-minute average).
- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 500 ppm (3-minute average).

5.2 WASTE RETRIEVAL SLUICING SYSTEM OPERATIONS AND EMISSIONS COLLECTION (CONT)

5.2.1.5 **REQUEST** process test vapor monitoring and sampling activities commence in accordance with Job Control System Work Packages ES-99-00054, ES-99-00055, 2E-99-00143 and 2E-99-00144.

5.2.1.6 **REQUEST** Waste Retrieval Sluicing System Process Engineering to evaluate relationship of Volatile Organic Compound emissions and duration of agitation at the specific locations (e.g., plot and trend Volatile Organic Compound emissions versus time to determine rate of increase associated with each area) and provide feedback to control Volatile Organic Compound emissions release throughout this evolution.

5.2.1.7 **RECORD** 296-C-006 Exhaust Stack Flow FI-13627B AND TIME of reading on DATA SHEET 2 approximately every 10 minutes during emissions collection.

5.2.1.8 **ADJUST** speed of Sluice Booster Pump P-0622 per TO-320-006, Section 5.4 as necessary to further control agitation of the waste surface as directed by the Test Director.

NOTE - The sluicing guide parameters presented in Table 1 and Table 2 are only applicable for MANUAL and FIXED POINT sluicer nozzle operation. If sufficient waste agitation is not achieved in MANUAL or FIXED POINT operation, the sluicer nozzle may be operated in AUTOMATIC per TO-320-006, Section 5.8 as directed by the Test Director, while still maintaining control of Volatile Organics Compound emissions.

5.2.1.9 **OPERATE** Waste Retrieval Sluicing System per TO-320-006, Section 5.5 as directed by the Test Director in accordance with the sluicing guide parameters identified in Table 1 **AND**

RECORD Operation Time and Volatile Organic Compound Emissions at the end of each agitation period for Controlled Agitation Area Determination on DATA SHEET 1.

5.2.1.10 **OPERATE** Waste Retrieval Sluicing System per TO-320-006, Section 5.5 as directed by the Test Director in accordance with the sluicing guide parameters identified in Table 2.

NOTE - Operation of heating coil HC-1361 should be controlled towards the end of the process test, provided time allows, to determine its effect on Volatile Organic Compound emissions and visibility in the tank.

5.2.1.11 **ENSURE** heating coil HC-1361 is **OFF** per TO-320-009, Section 5.3 as directed by the Test Director.

5.2.1.12 **ENSURE** heating coil HC-1361 is **ON** per TO-320-009, Section 5.3 as directed by the Test Director.

5.3 STABILIZE VOLATILE ORGANIC EMISSIONS

WARNING

Operation of the Waste Retrieval Sluicing System may result in potentially elevated levels of Volatile Organic Compounds in the 296-C-006 ventilation system effluent. Thus, waste agitation should be controlled and stabilized if necessary.

5.3.1 **OPERATE** sluicer as required per TO-320-006, Section 5.6, 5.7, AND 5.8 to STABILIZE Volatile Organic Compound emissions from tank 241-C-106 using one or more of the following modes of operations as directed by the Test Director.

- **REDUCE** rate of sweep action of the sluice nozzle per TO-320-006, Section 5.6 OR 5.8 to further control agitation of the waste surface as directed by the Test Director.
- **OPERATE** sluicer as required per TO-320-006, Section 5.7 to position the sluicer nozzle to the fixed point area yielding least amount of Volatile Organic Compound emissions as directed by the Test Director (Reference Data Sheet 1 and Waste Retrieval Sluicing System Process Engineering Evaluation).
- **ADJUST** speed of Sluice Booster Pump P-0622 per TO-320-006, Section 5.11 to further control agitation of the waste surface as directed by the Test Director.
- **SHUTOFF** Sluice Booster Pump P-0622 per TO-320-006, Section 5.4 to further control agitation of the waste surface as directed by the Test Director.

5.4 EMERGENCY SHUTDOWN

NOTE - Waste Retrieval Sluicing Systems may be restarted per TO-320-006, Section 5.13 if the volatile organic compound concentrations at the 296-C-006 stack is below 350 ppm WITHOUT exceeding 500 ppm (60-minute average) **AND** the concentration at 241-AZ-702 stack has NOT exceeded 50 ppm **AND** approval for restart is received from the Joint Test Review Group.

WARNING

Personnel must don self contained breathing apparatus if they must leave the MO-211 trailer while it is downwind of the 296-C-006 stack.

5.4.1 **PERFORM** TO-320-006, Section 5.12 **AND EVACUATE** all NON-ESSENTIAL personnel from C FARM to the staging area at the Fluor Daniel Northwest All-Trades trailer/lunch room on Buffalo Avenue to await further instructions, **IF** the following condition exists:

- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 400 ppm (3-minute average).

5.4.1.1 **VAPOR** sampling activities may **RESUME** after volatile organic compound concentrations as measured by Flame Ionization Detector at the 296-C-006 Exhaust Stack drop below 400 ppm.

5.4.2 **PERFORM** TO-320-006, Section 5.12 **AND EVACUATE** ALL personnel from C FARM to the staging area at the Fluor Daniel Northwest All-Trades trailer/lunch room on Buffalo Avenue to await further instructions, **IF** the following condition exists:

- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 500 ppm (3-minute average).

5.5 ROUTINE SHUTDOWN

NOTE - Waste Retrieval Sluicing Systems may be restarted per TO-320-006, Section 5.13 if the volatile organic compound concentrations at the 296-C-006 stack is below 350 ppm WITHOUT exceeding 500 ppm (60-minute average) **AND** the concentration at 241-AZ-702 stack has NOT exceeded 50 ppm.

5.5.1 **PERFORM** TO-320-006, Section 5.13, **IF** any of the following conditions exist:

- Volatile Organic Compound concentrations measured by Organic Vapor Monitor at the 241-AZ-702 stack exceed 50 ppm (3-minute average).
- Process test vapor monitoring and sampling activities have been completed in accordance with Job Control System Work Packages ES-99-00054, ES-99-00055, 2E-99-00143, and 2E-99-00144.
- Process Test Duration Time of 20 hours (run time) is complete.
- Discretion of the Test Director.

TABLE 1 - PROCESS TEST SLUICING PARAMETERS FOR CONTROLLED AGITATION AREA DETERMINATION

SLUICE STREAM IMPACT POINT (FEET)	TILT ANGLE (DEGREES)	MAXIMUM PAN ANGLE (DEGREES)	SWEEP PATH	MAXIMUM OPERATION TIME (MINUTES)
0 - 5	0 - 38	+/-2	0 - 1	N/a*
0 - 5	0 - 38	+/-2	0 - 1	30**
20 - 25	70 - 74	+/-5	4 - 5	30**
50 - 60	83 - 86	+/-15	10 - 12	30**

* SLUICER OPERATED FIXED POINT WITHIN THE DESIGNATED PAN ANGLE WITH THE P-0621 PUMP OPERATING ONLY. WASTE RETRIEVAL SLUICING SYSTEM WILL BE OPERATED IN THIS MODE UNTIL DESIRED LIQUID LEVEL FOR START OF SLUICING PER BATCH CONTROL RECORD IS REACHED

** SLUICER OPERATED FIXED POINT WITHIN THE DESIGNATED PAN ANGLE WITH BOTH THE P-0621 PUMP AND P-0622 PUMP OPERATING AT 330 - 350 GPM

TABLE 2 - PROCESS TEST SLUICING PARAMETERS FOR ALL PUMPS

P-1362 BOOSTER PUMP RPM	SLUICE STREAM IMPACT POINT (FEET)	TILT ANGLE (DEGREES)	MAXIMUM PAN ANGLE* (DEGREES)	SWEEP PATH
1624	50 - 55	83 - 84	+/-22	10 - 11
1624	45 - 50	82 - 83	+/-30	9 - 10
1624	40 - 45	81 - 82	+/-36	8 - 9
1624	35 - 40	79 - 81	+/-42	7 - 8
1624	30 - 35	77 - 79	+/-47	6 - 7
1624	25 - 30	74 - 77	+/-53	5 - 6
1624	20 - 25	70 - 74	+/-57	4 - 5
1624	15 - 20	65 - 70	+/-62	3 - 4
1624	10 - 15	55 - 65	+/-67	2 - 3
1624	5 - 10	38 - 55	+/-71	1 - 2
1624	0 - 5	0 - 38	+/-76	0 - 1

* SLUICER OPERATED FIXED POINT OR MANUAL WITHIN THE DESIGNATED PAN ANGLE AS DIRECTED BY THE TEST DIRECTOR

DATA SHEET 1 - PROCESS TEST SLUICING PARAMETERS FOR CONTROLLED AGITATION AREA DETERMINATION

SLUICE STREAM IMPACT POINT (FEET)	TILT ANGLE* (DEGREES)	PAN ANGLE* (DEGREES)	SWEEP PATH	OPERATION TIME* (MINUTES)	VOLATILE ORGANIC COMPOUND EMISSIONS (PPM)
0 - 5	1.10	.65	0 - 1	GAP 3-2-99 ~~15~~ 29	5.2
0 - 5	1.10	.65	0 - 1	30	11.6
20 - 25	73.29	.58	4 - 5	30	25.6
50 - 60	83.53	13.66	10 - 12	30	43.4

*MAXIMUM TILT ANGLE, PAN ANGLE, AND OPERATION TIMES ARE IDENTIFIED IN TABLE 1 FOR EACH SWEEP MODE

DATA SHEET 2 - 296-C-006 EXHAUST STACK FLOW RATE

TIME (APPROXIMATELY EVERY 10 MINUTES DURING EMISSIONS COLLECTION)	FI-13627B Exh Stack Flow (SCFM)	RANGE (SCFM)	LIMIT* (SCFM)
1334	350.0	200 - 360	360
1344	327.4	200 - 360	360
1354	325.0	200 - 360	360
1404	360.0	200 - 360	360
1414	360.0	200 - 360	360
1424	320.0	200 - 360	360
1435	360.0	200 - 360	360
1445	322.0	200 - 360	360
1455	334.9	200 - 360	360
1505	345.0	200 - 360	360
1515	329.0	200 - 360	360
1525	326.9	200 - 360	360
1535	360.0	200 - 360	360
1545	345.0	200 - 360	360
1555	353.0	200 - 360	360
1605	350.0	200 - 360	360
1615	350.0	200 - 360	360
1625	350.8	200 - 360	360
1635	340.0	200 - 360	360
1645	350.0	200 - 360	360
1655	330.0	200 - 360	360
1705	350.0	200 - 360	360
1715	352.0	200 - 360	360
1725	340.0	200 - 360	360
1735	337.4	200 - 360	360
1745	354.0	200 - 360	360
1755	345.0	200 - 360	360

* Notice of Construction Limit, NOC DOE/RL-95-45, "Radioactive Air Emissions Notice Of Construction Project W-320, Tank 241-C-106 Sluicing"

DATA SHEET 2 - 296-C-006 EXHAUST STACK FLOW RATE

TIME (APPROXIMATELY EVERY 10 MINUTES DURING EMISSIONS COLLECTION)	FI-13627B Exh Stack Flow (SCFM)	RANGE (SCFM)	LIMIT* (SCFM)
RAP 3-7-99 ~~1805~~ 1805	340.0	200 - 360	360
1815	337.0	200 - 360	360
1825	350.0	200 - 360	360
1835	335.0	200 - 360	360
1845	345.0	200 - 360	360
1855	330.0	200 - 360	360
1905	354.0	200 - 360	360
1915	RAP 3-7-99 ~~341.7~~ 341.7	200 - 360	360
1925	336.8	200 - 360	360
1935	339.0	200 - 360	360
1945	345.0	200 - 360	360
1955	330.0	200 - 360	360
2005	354.0	200 - 360	360
2015	340.0	200 - 360	360
2025	350.0	200 - 360	360
2035	340.0	200 - 360	360
2045	345.0	200 - 360	360
2055	350.1	200 - 360	360
		200 - 360	360
		200 - 360	360
		200 - 360	360
		200 - 360	360
		200 - 360	360
		200 - 360	360
		200 - 360	360
		200 - 360	360
		200 - 360	360

* Notice of Construction Limit, NOC DOE/RL-95-45, "Radioactive Air Emissions Notice Of Construction Project W-320, Tank 241-C-106 Sluicing"

PROCEDURE HISTORY SIGNATURE SHEET

PCA Incorporated:	NEW	ESQ
Procedure Signatures for	TYPE OF CHANGE	REVIEW DESIGNATOR
USQ Screening Number: TF-98-1248, Rev 0		

POSITION/ORG	DELEGATE	DATE
NCO/DST	T.A. Pile	12/12/98
QA	W.L. Adams	12/10/98
Nuclear Safety	L.E. Thomas	12/10/98
Industrial Hygiene	K.M. Bowen	12/13/98
WRSS OE	J.E. Andrews	12/13/98
Rad Control	J. Pieper	12/10/98
Env Engineer	G.M. Crummel	12/13/98
Cog Engr	J.M. Jones	12/13/98
Procedure Writer	W.G. Cox	12/13/98
Approval Authority	T.J. Kelley	12/13/98

Pages Affected	Summary of Change	Reason for Change
All	New process test procedure.	For sampling total organics at C-106.

PROCEDURE HISTORY SIGNATURE SHEET (Cont.)

Current Modification: A-1

USQ Screening Number: TF-96-390, Rev 0

Approval Designator: N/A

PCA Incorporated: ETF-98-858

POSITION/ORG	DELEGATE	DATE
NPO	S. Stamper	12/14/98
Mgr/Retrieval	K.J. Anderson	12/14/98
Engineer	J.M. Jones	12/14/98
Acceptance Review	B.E. Raymond	12/15/98
Approval Authority	K.J. Anderson	12/14/98

Justification: Engineering Request/Project Support

Summary of Changes: Page 3, 1.2, Deleted JCS work package number.
Page 4, 2.2.5, 2.2.7, Added JCS work package number, clarified CPO responsibilities.
Page 5, 2.2.8, 2.3, Deleted JCS work package numbers, placed correct work package title in procedure.
Page 9, 4.2, Corredted Title of JCA work package, deleted JCS work package number.
Page 10, 4.3.3, Added reference to use of specific sampling.
Page 11, 5.1.2, 5.1.3, 5.1.6, Corrected mispelling, deleted JCS work package numbers.
Page 12, 5.2.1.3, Deleted JCS work package number.
Page 13, 5.4.1, Deleted JCS work package number.

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3/7/99 cont

1025- Late entry Breakers on MN 241-Ay-51 @ 10:15- 13:53

1032- Completed sect. 5.1 of TO-320-006 1355

1104- Opt enable alarm @ DACS. All alarms assoc with flow rate for FI-0623A for prep of sluicing 13:58 1402

1118 Received the Ser. air & water alarm 1405

1152- MO-211 opt lowering winch in the waste. 1408 1413

1204- MO-~~204~~ 211 opt raising Energ opt notified TMACS opt. 14.18

1230- Weather station called for update 1423
Daylight - Calm (5-15 mph) from S.E.
Night - calm (5-15 mph) from N.W.

1254 Sampling crew starting baseline on the stack. 1427

1313- Received the Ser. air and water C-1 opt to check. 1429 14:30

1318- The Baseline for stack 6.5 ppm.

1320- Late entry Starting level for 106-C 75.48, Ay-102 169.42 14:33

1324- ~~C farm~~ 3/7/99 MO-211 Instructed Ay farm opt to start pumps. Pump Started from Ay-102 → 106-C transfer 14:38

1328- Received waste from Ay 102. Stack reading for sampling @ stack 5ppm 14:44 1448 1454

13:32 Stack reading 16 ppm. Late entry Sluice nozzle ~~3~~ started @ 80° opt reposition @ 0° 1500 1503

1334 Stack reading 14 ppm

13:39 T.D. requested pan & tilt post. T. 1.1, P-.65. Stack reading 5.3 1505 1508 1513

[illegible] started the sump pump

Cont

pump.

13:53 Stack reading 5.5 ppm

1355 MO-211 opt raising Booster pump speed to 1620.

13:58 Stack reading 5.4 ppm

1402 Ay Booster pump started.

1405 Stack reading 5.8 ppm

1408 Stack reading 5.8 ppm

1413 Received the Sec Air & water alarm

Stack reading 7.4 ppm

14.18 Stack reading 8.4 ppm

1423 Stack reading 9.0 ppm. IH tech disconnecting equip to do a drift check.

1427 IH tech reconnected equip to stack.

1429 Stack reading 11 ppm

14:32 Stack reading 11.6 ppm. MO-211 opt going to pos. # 2 on the sluice nozzel.

14:33 Sluice nozzel @ ~~tilt to~~ pan 199 pan .58, tilt 73.29. Camera pos. tilt @ 101 pan 199.

14:38 Stack reading 14.5 ppm

14:41 Stack reading 17.0 ppm

1448 Stack reading 19.0 ppm

1454 Stack reading 21.2 ppm

1500 Stack reading 23.1 ppm

1503 Moving to pos #3 on the sluice nozzle. Sluice nozzle pan at 13.84, tilt 83.53

1505 Stack reading 25.6 ppm

1508 Stack reading 28.1

1513 Stack reading 31.3

1518 [illegible]

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Cont 3-7-99

1531 I H tech reconnected stack test equip.

1535 MO-211 doing sweep path 10 to 11 in man. Waiting for stack reading

Stack reading 1.6 ppm. PID 59.7

1547 Stack reading 43.4 ppm Opt starting sweep path 10 to 11

1553 Stack reading 46.3 ppm

1559 Stack reading 48.9 ppm

1601 Stack reading 50.0 ppm

1608 Stack reading 53.3 ppm

1612 Changing sweep path to 9 to 10

1613 Stack reading 55.0 ppm

1618 Stack reading 58.6 ppm

1622 I H tech loos reading on the FID replacing equip

1624 I H tech getting reading again @ 60.8 pp

1630 Stack reading 60.3 ppm, PID 84.8

1633 Stack reading 62.3 ppm

1634 Changing sweep path 8 to 9 tilt pos 81.53

1638 Stack reading 65.3 ppm

1643 Stack reading 67.7 ppm

1644 Changing sweep path to 7-8

1648 Stack reading 72.7 ppm

1651 Changing sweep path to 6-7 tilt pos 77.14

1653 Stack reading 78.0 ppm

1657 Changing sweep path to 5-6 tilt pos 75.31

~~1658 Stack reading~~ 3/7/99

1708 Late entry - 1704 stack reading 86.0 pp

PID 110 PID - 1706 stack reading 96.0 pp

1708 Stack reading 97.3 ppm

Changing sweep path 4-5 tilt pos 72.2

1718 S
1720 C
1727 C
1728 S
1734 C
1735
1739 C
S
S
1743 C
1744 S
1747 C
1749 S
1753 S
S
1756 S
1756 S
1758 S
1801 S
1807 S
1811 S
1815 S
1823 S
S
1828 P
1829 S
1831 S
1835
1844
1849
1854
1859
1845

1718 Stack reading 112 ppm
1720 Changing sweep path 2 to 3 tilt 57.04
1727 Changing sweep path ~~1 to~~ 1-2 tilt 39.90
1728 Stack reading 124 ppm
1734 Changing sweep path 1 to 01 and tilt 4.99
1735 FID is reading 135 ppm
1739 Changing sweep path 1-2 tilt pos. 39.90
Stack reading 139 ppm disconnecting equip for Cal.
1743 Changing sweep path 2-3 tilt pos. 55.98
1744 Stack reading 148.0 ppm
1747 Changing sweep path 3-4 tilt pos. 65.28
1749 Stack reading 162.0 ppm
1753 Stack reading 165.0 ppm. Changing sweep path 4 to 5 tilt pos. 71.76
1756 Stack reading 170 ppm
1756 Stack reading 162.0 ppm
1758 Stack Reading 175.0 ppm
1801 Stack Reading 180.0 ppm
1807 Stack Reading 185.0 ppm
1811 Stack Reading 190.0 ppm
1815 Stack reading 195.0 ppm
1823 Stack reading 198.0 ppm disconnecting equip for cal.
1828 Reconnected equip @ stack
1829 Stack reading 192 ppm
1831 Stack reading 198 ppm
1835 Stack reading at 200 ppm
1844 Stack reading at 202 ppm
1849 Stack reading at 203 ppm
1854 Stack reading at 204 ppm
1859 Stack reading at 204 ppm
1845 Started sweep path 4-5.

Cont 3-7-99

1904 Stack reading 205 ppm
1907: Changing sweep paths from 5-6 to 6-7 and tilt is 77.85
1909: Stack reading 207 ppm
1910: Hi DP on strainer
Late entry 1905: Air and Water service trouble alarm in. Sent C-1 operator out to investigate.
1913: completed sweep path 6-7 going to 7-8 with tilt at 79.88.
1914: Stack reading 206 ppm
1918: completed sweep path 7-8 going to sweep path 8-9 with tilt at 81.68.
1919: stack reading 208 ppm.
1924 Stack reading 209 ppm
1928 Started auto sweep @ +85°-85° pan and tilt @ 37.38. Stack reading 212 ppm
1930 Stopped auto sluice.
1934 Stack reading 213 ppm. I H tech disconnecting equip for cal.
1938 Started sweep path #2 in auto pan -80°-80° tilt 54.26
1940 Stack equip reconnected and stable reading @ 220 ppm
1941 Stack reading 225 ppm
1943 Stopping auto sluicing. Going back to man. sluicing. Going to sweep path 2-3
1945 Started man sweep pan 2 to 3 and tilt 59.43
1948 Changing sweep path 3 to 4 tilt @ 65.13
1948 Stack reading 228 ppm

cont 3-7-99

2007 Stack reading 231 ppm
2013 Stack reading 232 ppm
2018 Stack reading 232 ppm
2023 Shut down ~~pu~~ Boosters and sub. pumps Requesting Ay to shut down pumps.
2024 Stack reading 229 ppm
2025 Both pumps down @ Ay.
2033 Suma Sampling @ 702 A2 is complete
2038 Stack Reading 221 ppm
2053 Stack Reading 208 ppm
2108 Stack Reading 192 ppm
2123 Stack Reading 178 ppm
2123 Stack Reading PID (15 ppm)

Material balance of -.61

	start	finish	finish
C-106	75.48	73.77	
AY-102	169.42	170.52	

PROCESS TEST PROCEDURE PHASE III: WASTE RETRIEVAL SLUICING SYSTEM EMISSIONS COLLECTION

Last Full Revision: A-0

Release Date: 12/13/98

USQ Screening Number: TF-98-1248, Rev 0

Approval Designator: ESQ

Current Modification: A-4

USQ Screening Number: TF-98-1201, Rev 1

Approval Designator: N/A

PCA Incorporated: ETF-99-240

POSITION/ORG	DELEGATE	DATE
LNCO/DST	Gregory J. Sullivan	3/26/99
Manager/WRSS	J.E. Andrews	3/26/99
Cog Engineer/WRSS	J.M. Jones	3/25/99
Acceptance Review	L. Ross	3/26/99
Approval Authority	K.J. Anderson	3/26/99

Justification: Tilt angle needed changed to account for a lower operating waste level and make editorial corrections.

Summary of Changes:

Page 2: Changed Table 1 title to read PROCESS TEST SLUICING PARAMETERS FOR MANUAL SLUICING.

Page 17: Changed Table 1 title to read PROCESS TEST SLUICING PARAMETERS FOR MANUAL SLUICING.
Added new table entry for additional sluice stream impact point 55-60 ft.
Modified tilt angle references.

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TABLE 1 - PROCESS TEST SLUICING PARAMETERS FOR MANUAL SLUICING 17

DATA SHEET 1 - 296-C-006 EXHAUST STACK FLOW RATE 18

PROCEDURE HISTORY SIGNATURE SHEET 19

1.0 PURPOSE AND SCOPE

1.1 PURPOSE

This procedure provides guidance during a process test in which Volatile Organic Compounds levels will be increased in the 296-C-006 ventilation system effluent. The Waste Retrieval Sluicing System will be operated in a controlled manner to achieve increased levels of Volatile Organic Compounds. Control of the Volatile Organic Compound levels will be controlled throughout this process test evolution via several methods as dictated in this procedure. These methods include operating the Waste Retrieval Sluicing System within tighter parameters than those identified for normal sluicing operations, receiving constant feedback from Waste Retrieval Sluicing System Process Engineering on Volatile Organic Compound trend data, and stabilizing the Volatile Organic Compound levels via aiming the sluicer nozzle to a fixed point, reducing the speed of the P-0622 booster pump, etc.

1.2 SCOPE

This governing process test procedure and supporting routine operating procedures TO-320-005 and TO-320-006 are performed in conjunction to control and perform Waste Retrieval Sluicing System operations and Volatile Organic Compound sampling activities at the exhaust stacks associated with tanks 241-C-106 and tank 241-AY-102. TO-320-005 coordinates interaction between Waste Retrieval Sluicing System Process Engineering and Waste Retrieval Sluicing System Operations to ensure and document performance of major pre-requisite activities such as completion of the Batch Control Record, start-up of required support systems, and removal of administrative locks on the Waste Retrieval Sluicing System pumps. Once these items are complete the user is directed to specific sections of operating procedure TO-320-006 to perform the actual system operation. Waste Retrieval Vapor Sampling activities will be performed in accordance with Job Control System Work Packages ES-99-00089, ES-99-00090, 2E-99-00577 and 2E-99-00578, at prescribed locations and intervals. Upon completion of the process test, or shutdown for any reason, the user is returned to procedure TO-320-005 and this test procedure to perform specific post process test activities such as reinstallation of administrative locks and data collection and evaluation.

2.0 INFORMATION

2.1 TERMS AND DEFINITIONS

Volatile Organic Compound - As used in this procedure means a measure of the total concentration of airborne organic (carbon based) compounds being released by agitation of tank waste during Waste Retrieval Sluicing System operation.

2.2 RESPONSIBILITIES

2.2.1 Process Engineering:

- Responsible for providing process engineering support to Waste Retrieval Sluicing System operations as identified in procedures TO-320-005, TO-320-006, and this procedure.

2.2.2 Waste Retrieval Sluicing System Operations Engineer:

- Certified Operations Engineer will act as the Test Director and is responsible for start-up and supervision of all field activities, ensuring and documenting that prerequisite conditions are met, and coordinating activities among the various organizations as identified in this test procedure and procedures TO-320-005 and TO-320-006.

2.2.3 Nuclear Chemical Operators:

- Responsible for verification, documentation, and performance of process test activities as described in procedures TO-320-005, TO-320-006, and this procedure.

2.2.4 Health Physics Technicians:

- Responsible for performing pre-established radiological surveys and recommending radiological controls and actions to the Test Director as described in procedures TO-320-005 and TO-320-006.

2.2.5 Industrial Hygiene Technicians:

- Responsible for performing pre-established stack, area, and personal sampling during the process test as described in Job Control System Work Packages ES-99-00089, ES-99-00090, 2E-99-00577 and 2E-99-00578. Additional sampling will be performed as directed by the Industrial Hygienist.

2.2.6 Industrial Hygienist:

- Responsible for providing Industrial Hygiene support to Waste Retrieval Sluicing System operations as identified in the TANK FARM HEALTH AND SAFETY PLAN, HNF-WM-SD-HSP-002.

2.2 RESPONSIBILITIES (Cont.)

2.2.7 Characterization Project Operations:

- Responsible for the installation of sampling tubes at 296-C-006 stack as described in Job Control System Work Package ES-99-00089 and collection of pre-established SUMMA canister and particulate filter samples at the 296-C-006 stack during the process test as described in Job Control Work System Work Packages ES-99-00090.

2.2.8 Special Analytical Support:

- Responsible for the collection of pre-established Triple Sorbent Trap, Sorbent Tube Train, and Polyurethane Foam samples during the process test as described in Job Control System Work Package 2E-99-00577.

2.2.9 Waste Retrieval Sluicing System Cognizant Engineers:

- The Cognizant Engineer is responsible for providing technical assistance to Operations management and the Test Director throughout the performance of this process test.

2.2.10 Environmental Compliance Officer:

- The Environmental Compliance Officer is responsible for interfacing between State of Washington regulators and operations.

2.3 REFERENCES

- HNF-4212, Rev. 0, Waste Retrieval Sluicing System Emissions Collection Phase III
- HNF-4034, Rev. 0, Waste Retrieval Sluicing System Emissions Collection Phase II
- HNF-4030, Waste Retrieval Sluicing System Vapor Sampling and Analysis Plan for Evaluation of Organic Emissions
- TO-320-005, WRSS Start-up and Process Control
- TO-320-006, TK-241-C-106 Waste Retrieval Sluicing System Sluicing Operations
- Job Control System Work Package ES-99-00089, Installation of the Sampling Tubes in the Stack at C-106
- Job Control System Work Package ES-99-00090, Vapor Sampling at C-106
- Job Control System Work Package 2E-99-00577, 296-C-006 TOC/VOC w/FID & OVM
- Job Control System Work Package 2E-99-00578, 241-AZ-702 Monitor VOC at AY/AZ Exh w/OVM

2.4 GENERAL INFORMATION

2.4.1 The process test is not to exceed a period of approximately 13 hours. If extension is requested, Joint Test Review Group approval must be obtained.

2.4.2 During the actual process test activities, operators and support crews must maintain a constant awareness of many parameters to prevent potential equipment damage and violation of associated Limiting Conditions of Operation, Technical Safety Requirements, and the analyzed safety envelope for the Waste Retrieval Sluicing System.

2.4.3 Control of the Volatile Organic Compound levels will be controlled throughout this process test evolution via several methods as dictated in this procedure. These methods include operating the Waste Retrieval Sluicing System within tighter parameters than those identified for normal sluicing operations, receiving constant feedback from Waste Retrieval Sluicing System Process Engineering on Volatile Organic Compound trend data, and stabilizing the Volatile Organic Compound levels via aiming the sluicer nozzle to a fixed point, reducing the speed of the P-0622 booster pump, etc.

2.5 RECORDS

2.5.1 The completed Working Copy of this process test procedure (including data sheets), TO-320-005, TO-320-006, and supporting sampling Job Control System work packages will be kept as permanent records.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 PERSONNEL SAFETY

The precautions and limitations as they pertain to personnel safety are identified in pre-approved procedures TO-320-005 and TO-320-006 and supporting Job Control system sampling work packages. In addition to those requirements listed in the referenced procedures, the following are applicable:

WARNING - Operation of the Waste Retrieval Sluicing System may create potentially elevated levels of volatile organic compounds in the 296-C-006 ventilation system effluent. Appropriate breathing air controls and actions will be directed by Industrial Hygiene for worker safety.

WARNING - Personnel must take cover or don self contained breathing apparatus if they must leave the MO-211 trailer while it is downwind of the 296-C-006 stack.

3.2 RADIATION AND CONTAMINATION CONTROL

The precautions and limitations as they pertain to radiation and contamination control are identified in pre-approved procedures TO-320-005 and TO-320-006 and supporting Job Control System sampling work packages. There are no additional radiation and contamination controls associated with this process test outside those already identified in the referenced procedures.

3.3 ENVIRONMENTAL COMPLIANCE

The precaution and limitations as they pertain to environmental compliance control are identified in pre-approved procedures TO-320-005 and TO-320-006. In addition to those requirements listed in the referenced procedures, the following is applicable:

- Environmental Operations Compliance must be notified in the event that volatile organic compound concentrations measured at the 296-C-006 Exhaust Stack exceeds 500 ppm as described in meeting minutes (REQUEST FOR ECOLOGY CONCURRENCE ON DRAFT STRATEGY/PATH FORWARD TO ADDRESS CONCERNS REGARDING ORGANIC EMISSIONS FROM C-106 SLUICING ACTIVITIES, December 3, 1998) approved by The Washington State Department of Ecology.

- Environmental Operations Compliance must be notified in the event that Volatile Organic Compound concentrations measured at the 241-AZ-702 exhaust stack exceeds 50 ppm as described in the Notice of Construction for that facility.

3.4 LIMITS

Limits as they pertain to Operational and Authorization Basis controls and requirements are identified in pre-approved procedures TO-320-005 and TO-320-006 and supporting Job Control System sampling work packages. In addition to those requirements listed in the referenced procedures, the following limits established for stabilizing the Volatile Organic Compound emissions from tank 241-C-106:

- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 300 ppm (3-minute average).

The following limits are established for routine shutdown of Waste Retrieval Sluicing System:

- Volatile Organic Compound concentrations measured by Organic Vapor Monitor at the 241-AZ-702 stack exceed 50 ppm (3-minute average).

- Process Test Duration Time of 13 hours (run time) is complete.

- Discretion of the Test Director.

3.4 LIMITS (CONT)

NOTE - Non-essential personnel are identified as those persons not responsible for safe-mode shutdown and restoration of the Waste Retrieval Sluicing System as defined by Operations Management.

The following limit is established for emergency shutdown of the Waste Retrieval Sluicing System and evacuation of all non-essential personnel in C Farm to the staging area at the Fluor Daniel Northwest All-Trades trailer/lunch room on Buffalo Avenue to await further instructions:

- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 400 ppm (3-minute average).

NOTE - Upon termination of the Process Test, an evaluation and approval from the Joint Test Review Group is required for restart of the Process Test.

The following limit is established for emergency shutdown of the Waste Retrieval Sluicing System, termination of the Process Test, and evacuation of all personnel in C Farm to the staging area at the Fluor Daniel Northwest All-Trades trailer/lunch room on Buffalo Avenue to await further instructions:

- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 500 ppm (3-minute average).

4.0 PREREQUISITES

4.1 SPECIAL TOOLS, EQUIPMENT AND SUPPLIES

Special tools, equipment, and supplies are identified in pre-approved procedures TO-320-005 and TO-320-006 and supporting sampling work packages.

4.2 PERFORMANCE DOCUMENTS

The following procedures and work packages will be needed to perform this procedure:

- TO-320-005, WRSS STARTUP AND PROCESS CONTROL
- TO-320-006, TK-241-C-106 Waste Retrieval Sluicing System Sluicing Operations
- Job Control System Work ES-99-00089 , Installation of the Sampling Tubes in the Stack at C-106
- Job Control System Work Package ES-99-00090 , Vapor Sampling at C-106
- Job Control System Work Package 2E-99-00577 , 296-C-006 TOC/VOC w/FID & OVM
- Job Control System Work Package 2E-99-00578 , 241-AZ-702 Monitor VOC at AY/AZ Exh w/OVM

4.3 CONDITIONS AND ACTIONS

The following conditions and actions must be completed prior to performing this procedure:

4.3.1 Sampling equipment and support structures are installed per Job Control System Work Package ES-99-00089 , Installation of the Sampling Tubes in the Stack at C-106.

4.3.2 Obtain 8-hour forecast from Hanford Meteorological Station regarding wind direction, wind speed, atmospheric stability, etc., and discuss findings with Waste Retrieval Sluicing System Management.

4.3.3 Receipt of approval from Waste Retrieval Sluicing System Operations Engineer, Double Shell Tank Shift Manager, and Joint Test Review Group to proceed with readiness activities and process test.

_____ / 3-28-99
Test Director Signature Date

4.3.4 Conduct a PRE-JOB SAFETY MEETING with all personnel involved in performance of this process test.

- All work will be performed under Radiation Work Permit E-1116 or the specific Radiation Work Permit referenced in the sampling Work Package.

4.3.5 Performance of TO-320-005 through Step 5.2.1.

5.0 PROCEDURE

5.1 WASTE RETRIEVAL SLUICING SYSTEM READINESS

NOTE - Steps 5.1.1 through 5.1.5 of this procedure may be performed concurrently to facilitate operations.

5.1.1 **ENSURE** communications are **ESTABLISHED AND MAINTAINED** between MO-211, 241-AY-51, and remote vapor sampling crews.

5.1.2 **ENSURE** all C Farm change trailers (lower, middle, and upper) are unlocked to allow egress from the C Farm.

5.1.3 **ENSURE** baseline vapor sampling activities have commenced in accordance with Job Control System Work Packages ES-99-00090, 2E-99-00577, and 2E-99-00578.

5.1.4 **ENSURE** safety barricades are erected to prevent personnel not associated with the Process Test from entering C Farm process test area defined by the Double-Shell Tank Shift Manager and Test Director:

At a minimum barricades will be established at:

- Approximately 50 feet east of the intersection of Seventh and Eighth Streets on Eighth Street
- Approximately 50 feet west of the intersection of Eighth Street and Canton Avenue on Eighth Street
- Approximately 50 feet west of the intersection of the dirt road north of AN Farm and Canton Avenue on the dirt road
- Approximately 50 feet north of the intersection of Seventh Street and Buffalo Avenue on Buffalo Avenue.

5.1.5 **PERFORM** TO-320-006 through Section 5.1 AND Section 5.4 through Step 5.4.19, **AND RETURN** to step 5.1.6 of this procedure.

5.1.6 **ENSURE** baseline vapor sampling activities have been completed in accordance with Job Control System Work Packages ES-99-00090, 2E-99-00577, and 2E-99-00578 prior to the start of the Waste Retrieval Sluicing System.

5.2 WASTE RETRIEVAL SLUICING SYSTEM OPERATIONS AND EMISSIONS COLLECTION

WARNING

Operation of the Waste Retrieval Sluicing System may result in potentially elevated levels of Volatile Organic Compounds in the 296-C-006 ventilation system effluent. Appropriate breathing air controls and actions will be directed by Industrial Hygiene for worker safety.

5.2.1 **COMPLETE** TO-320-006, Sections 5.4 and 5.5 as directed by the Test Director with the following considerations:

5.2.1.1 **IF** MO-211 is downwind of stack (indicated by wind socks), **SHUT OFF** trailer ventilation and remain inside.

5.2.1.2 **IN ADDITION** to the conditions listed in TO-320-006, Section 5.4, **IF** any of the following conditions occur, **STABILIZE** Volatile Organic Compound emissions from tank 241-C-106 in accordance with Section 5.3 of this procedure:

- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 300 ppm (3-minute average).

5.2.1.3 **IN ADDITION** to the conditions listed in TO-320-006, Section 5.4, **IF** any of the following conditions occur, **PROCEED** to Section 5.5 of this procedure to perform routine shutdown of the Waste Retrieval Sluicing System:

- Volatile Organic Compound concentrations measured by Organic Vapor Monitor at the 241-AZ-702 exceed 50 ppm (3-minute average).
- Process Test Duration Time of 13 hours (run time) is complete. Start of the process test is defined as start of the 241-AY-102 Immersible Pump P-0621 (e.g., agitation of 241-C-106 waste).
- Discretion of the Test Director.

5.2.1.4 **IN ADDITION** to the conditions listed in TO-320-006, Section 5.4, **IF** any of the following conditions occur, **PROCEED** to Section 5.4 of this procedure to perform emergency shutdown of the Waste Retrieval Sluicing System:

- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 400 ppm (3-minute average).
- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 500 ppm (3-minute average).

5.2 WASTE RETRIEVAL SLUICING SYSTEM OPERATIONS AND EMISSIONS COLLECTION (CONT)

5.2.1.5 **REQUEST** process test vapor monitoring and sampling activities commence in accordance with Job Control System Work Packages ES-99-00090, 2E-99-00577, and 2E-99-00578.

5.2.1.6 **REQUEST** Waste Retrieval Sluicing System Process Engineering to evaluate relationship of Volatile Organic Compound emissions and duration of agitation at the specific locations (e.g., plot and trend Volatile Organic Compound emissions versus time to determine rate of increase associated with each area) and provide feedback to control Volatile Organic Compound emissions release throughout this evolution.

5.2.1.7 **RECORD** 296-C-006 Exhaust Stack Flow FI-13627B AND TIME of reading on DATA SHEET 1 approximately every 10 minutes during emissions collection.

5.2.1.8 **ADJUST** speed of Sluice Booster Pump P-0622 per TO-320-006, Section 5.4 as necessary to further control agitation of the waste surface as directed by the Test Director.

NOTE - The sluicing guide parameters presented in Table 1 are only applicable for MANUAL and FIXED POINT sluicer nozzle operation. If sufficient waste agitation is not achieved in MANUAL or FIXED POINT operation, the sluicer nozzle may be operated in AUTOMATIC per TO-320-006, Section 5.8 as directed by the Test Director, while still maintaining control of Volatile Organics Compound emissions.

5.2.1.9 **OPERATE** Waste Retrieval Sluicing System per TO-320-006, Section 5.5 as directed by the Test Director in accordance with the sluicing guide parameters identified in Table 1 .

NOTE - Operation of heating coil HC-1361 should be controlled towards the end of the process test, provided time allows, to determine its effect on Volatile Organic Compound emissions and visibility in the tank. Coordinate the heater operation with sampling of the 106-C stack.

5.2.1.10 **ENSURE** heating coil HC-1361 is **OFF** per TO-320-009, Section 5.3 as directed by the Test Director.

5.2.1.11 **ENSURE** heating coil HC-1361 is **ON** per TO-320-009, Section 5.3 as directed by the Test Director.

5.3 STABILIZE VOLATILE ORGANIC EMISSIONS

WARNING

Operation of the Waste Retrieval Sluicing System may result in potentially elevated levels of Volatile Organic Compounds in the 296-C-006 ventilation system effluent. Thus, waste agitation should be controlled and stabilized if necessary.

5.3.1 **OPERATE** sluicer as required per TO-320-006, Section 5.6, 5.7, AND 5.8 to STABILIZE Volatile Organic Compound emissions from tank 241-C-106 using one or more of the following modes of operations as directed by the Test Director.

- **REDUCE** rate of sweep action of the sluice nozzle per TO-320-006, Section 5.6 OR 5.8 to further control agitation of the waste surface as directed by the Test Director.
- **OPERATE** sluicer as required per TO-320-006, Section 5.7 to position the sluicer nozzle to the fixed point area yielding least amount of Volatile Organic Compound emissions as directed by the Test Director (Reference Data Sheet 1 and Waste Retrieval Sluicing System Process Engineering Evaluation).
- **ADJUST** speed of Sluice Booster Pump P-0622 per TO-320-006, Section 5.11 to further control agitation of the waste surface as directed by the Test Director.
- **SHUTOFF** Sluice Booster Pump P-0622 per TO-320-006, Section 5.4 to further control agitation of the waste surface as directed by the Test Director.

5.4 EMERGENCY SHUTDOWN

NOTE - Waste Retrieval Sluicing Systems may be restarted per TO-320-006, Section 5.13 if the volatile organic compound concentrations at the 296-C-006 stack is below 350 ppm WITHOUT exceeding 500 ppm (60-minute average) **AND** the concentration at 241-AZ-702 stack has NOT exceeded 50 ppm **AND** approval for restart is received from the Joint Test Review Group.

WARNING

Personnel must don self contained breathing apparatus if they must leave the MO-211 trailer while it is downwind of the 296-C-006 stack.

5.4.1 **PERFORM** TO-320-006, Section 5.12 **AND EVACUATE** all NON-ESSENTIAL personnel from C FARM to the staging area at the Fluor Daniel Northwest All-Trades trailer/lunch room on Buffalo Avenue to await further instructions, **IF** the following condition exists:

- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 400 ppm (3-minute average).

5.4.1.1 **VAPOR** sampling activities may **RESUME** after volatile organic compound concentrations as measured by Flame Ionization Detector at the 296-C-006 Exhaust Stack drop below 400 ppm.

5.4.2 **PERFORM** TO-320-006, Section 5.12 **AND EVACUATE** ALL personnel from C FARM to the staging area at the Fluor Daniel Northwest All-Trades trailer/lunch room on Buffalo Avenue to await further instructions, **IF** the following condition exists:

- Volatile Organic Compound concentrations measured by Flame Ionization Detector at the 296-C-006 stack exceed 500 ppm (3-minute average).

5.5 ROUTINE SHUTDOWN

NOTE - Waste Retrieval Sluicing Systems may be restarted per TO-320-006, Section 5.13 if the volatile organic compound concentrations at the 296-C-006 stack is below 350 ppm WITHOUT exceeding 500 ppm (60-minute average) **AND** the concentration at 241-AZ-702 stack has NOT exceeded 50 ppm.

5.5.1 **PERFORM** TO-320-006, Section 5.13, **IF** any of the following conditions exist:

- Volatile Organic Compound concentrations measured by Organic Vapor Monitor at the 241-AZ-702 stack exceed 50 ppm (3-minute average).
- Process test vapor monitoring and sampling activities have been completed in accordance with Job Control System Work Packages ES-99-00090, 2E-99-00577, and 2E-99-00578 .
- Process Test Duration Time of 13 hours (run time) is complete.
- Discretion of the Test Director.

TABLE 1 - PROCESS TEST SLUICING PARAMETERS FOR MANUAL SLUICING

P-1362 BOOSTER PUMP RPM	SLUICE STREAM IMPACT POINT (FEET)	TILT ANGLE (DEGREES)	MAXIMUM PAN ANGLE* (DEGREES)	SWEEP PATH
1624	55 - 60	83 - 84	+/-13	11 - 12
1624	50 - 55	82 -83	+/-22	10 - 11
1624	45 - 50	81 - 82	+/-30	9 - 10
1624	40 - 45	79 - 81	+/-36	8 - 9
1624	35 - 40	77 - 79	+/-42	7 - 8
1624	30 - 35	75 - 77	+/-47	6 - 7
1624	25 - 30	72 - 75	+/-53	5 - 6
1624	20 - 25	68 - 72	+/-57	4 - 5
1624	15 - 20	62 - 68	+/-62	3 - 4
1624	10 - 15	52 - 62	+/-67	2 - 3
1624	5 - 10	34 - 52	+/-71	1 - 2
1624	0 - 5	0 - 34	+/-76	0 - 1

* SLUICER OPERATED FIXED POINT OR MANUAL WITHIN THE DESIGNATED PAN ANGLE AS DIRECTED BY THE TEST DIRECTOR

DATA SHEET 1 - 296-C-006 EXHAUST STACK FLOW RATE

TIME (APPROXIMATELY EVERY 10 MINUTES DURING EMISSIONS COLLECTION)	FI-13627B Exh Stack Flow (SCFM)	RANGE (SCFM)	LIMIT* (SCFM)
Start 11:00	370	200 - 360	360
11:10	350	200 - 360	360
11:20	320	200 - 360	360
11:30	325	200 - 360	360
11:40	320	200 - 360	360
11:50	324	200 - 360	360
12:00	350	200 - 360	360
12:10	311	200 - 360	360
12:20	330	200 - 360	360
12:30	340	200 - 360	360
12:40	341	200 - 360	360
12:50	349	200 - 360	360
13:00	359	200 - 360	360
13:10	350	200 - 360	360
13:20	349	200 - 360	360
13:30	355	200 - 360	360
13:40	354	200 - 360	360
13:50	356	200 - 360	360
14:00	358	200 - 360	360
14:10	333	200 - 360	360
14:20	355	200 - 360	360
14:30	319	200 - 360	360
14:40	334	200 - 360	360
14:50	325	200 - 360	360
15:00	315	200 - 360	360
15:10	310	200 - 360	360
15:20	346	200 - 360	360

* Notice of Construction Limit, NOC DOE/RL-95-45, "Radioactive Air Emissions Notice Of Construction Project W-320, Tank 241-C-106 Sluicing"

DATA SHEET 1 - 296-C-006 EXHAUST STACK FLOW RATE

TIME (APPROXIMATELY EVERY 10 MINUTES DURING EMISSIONS COLLECTION)	FI-13627B Exh Stack Flow (SCFM)	RANGE (SCFM)	LIMIT* (SCFM)
1530	322	200 - 360	360
1540	338.5	200 - 360	360
1550	314.7	200 - 360	360
1600	318.0	200 - 360	360
1610	345.8	200 - 360	360
1620	330.9	200 - 360	360
1630	337.9	200 - 360	360
1640	330.3	200 - 360	360
1650	337.2	200 - 360	360
1700	315.5	200 - 360	360
1710	339.1	200 - 360	360
1720	320.2	200 - 360	360
1730	335.8	200 - 360	360
1740	323.0	200 - 360	360
1750	334.0	200 - 360	360
1800	343.2	200 - 360	360
1810	347.1	200 - 360	360
1820	347.0	200 - 360	360
~~1840~~ 1830	358.6	200 - 360	360
1840	314.1	200 - 360	360
1850	337.6	200 - 360	360
1900	311.0	200 - 360	360
1910	327.8	200 - 360	360
1920	354.8	200 - 360	360
1930	337.5	200 - 360	360
1940	323.4	200 - 360	360
1950	317.8	200 - 360	360

* Notice of Construction Limit, NOC DOE/RL-95-45, "Radioactive Air Emissions Notice Of Construction Project W-320, Tank 241-C-106 Sluicing"

DATA SHEET 1 - 296-C-006 EXHAUST STACK FLOW RATE

TIME (APPROXIMATELY EVERY 10 MINUTES DURING EMISSIONS COLLECTION)	FI-13627B Exh Stack Flow (SCFM)	RANGE (SCFM)	LIMIT* (SCFM)
2000	311.5	200 - 360	360
2010	330.9	200 - 360	360
2020	327.8	200 - 360	360
2030	344.4	200 - 360	360
2040	347.4	200 - 360	360
2050	343.2	200 - 360	360
2100	342.8	200 - 360	360
2110	343.7	200 - 360	360
2120	337.0	200 - 360	360
2130	341.3	200 - 360	360
2140	348.2	200 - 360	360
2150	338.2	200 - 360	360
2200	348.1	200 - 360	360
		200 - 360	360
		200 - 360	360
		200 - 360	360
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		200 - 360	360

* Notice of Construction Limit, NOC DOE/RL-95-45, "Radioactive Air Emissions Notice Of Construction Project W-320, Tank 241-C-106 Sluicing"

PROCEDURE HISTORY SIGNATURE SHEET

PCA Incorporated:	NEW	ESQ
Procedure Signatures for	TYPE OF CHANGE	REVIEW DESIGNATOR
USQ Screening Number: TF-98-1248, Rev 0		

POSITION/ORG	DELEGATE	DATE
NCO/DST	T.A. Pile	12/12/98
QA	W.L. Adams	12/10/98
Nuclear Safety	L.E. Thomas	12/10/98
Industrial Hygiene	K.M. Bowen	12/13/98
WRSS OE	J.E. Andrews	12/13/98
Rad Control	J. Pieper	12/10/98
Env Engineer	G.M. Crummel	12/13/98
Cog Engr	J.M. Jones	12/13/98
Procedure Writer	W.G. Cox	12/13/98
Approval Authority	T.J. Kelley	12/13/98

Pages Affected	Summary of Change	Reason for Change
All	New process test procedure.	For sampling total organics at C-106.

PROCEDURE HISTORY SIGNATURE SHEET (Cont.)

Current Modification: A-1

USQ Screening Number: TF-96-390, Rev 0

Approval Designator: N/A

PCA Incorporated: ETF-98-858

POSITION/ORG	DELEGATE	DATE
NPO	S. Stamper	12/14/98
Mgr/Retrieval	K.J. Anderson	12/14/98
Engineer	J.M. Jones	12/14/98
Acceptance Review	B.E. Raymond	12/15/98
Approval Authority	K.J. Anderson	12/14/98

Justification: Engineering Request/Project Support

Summary of Changes: Page 3, 1.2, Deleted JCS work package number.
Page 4, 2.2.5, 2.2.7, Added JCS work package number, clarified CPO responsibilities.
Page 5, 2.2.8, 2.3, Deleted JCS work package numbers, placed correct work package title in procedure.
Page 9, 4.2, Corredted Title of JCA work package, deleted JCS work package number.
Page 10, 4.3.3, Added reference to use of specific sampling.
Page 11, 5.1.2, 5.1.3, 5.1.6, Corrected mispelling, deleted JCS work package numbers.
Page 12, 5.2.1.3, Deleted JCS work package number.
Page 13, 5.4.1, Deleted JCS work package number.

PROCEDURE HISTORY SIGNATURE SHEET (Cont.)

Current Modification: A-2

USQ Screening Number: TF-98-1248, Rev 1

Approval Designator: ES

PCA Incorporated: ETF-99-175

POSITION/ORG	DELEGATE	DATE
LNCO/WRSS	C.W. Peake	03/03/99
ENG/TWRS Safety	L.E. Thomas	03/04/99
MGR/WRSS	J.E. Andrews	03/03/99
TWRS Env	T.A. Dillhoff	03/03/99
Cog/WRSS Eng	J.M. Jones	03/03/99
Procedure Writer	W.G. Cox	03/04/99
Approval Authority	K.J. Anderson	03/04/99

Pages Affected	Summary of Change	Reason for Change
Page 1; Title	Modified title to identify this as PHASE II of the process test	Process Test Phase II to collect additional samples. This facilitates operation of the Waste Retrieval Sluicing System.
Page 4; Table of Contents based on heading and section changes	Generated new table of content headings based on changes to sections and applicable heading titles throughout the procedure	
Page 5; Step 1.1	Changed total to volatile throughout the procedure when referring to organic compounds; and Inserted text to emphasize that the intent is to control VOC emissions throughout process test	
Page 5; Step 1.2	Updated supporting JCS Work Package listings	
Page 6: Steps 2.2.1 & 2.2.3	Clarified process engineering and nuclear chemical operator responsibilities	

Page 6; Steps 2.2.5 and 2.2.7	Updated supporting JCS Work Package listings	
Page 6; Steps 2.2.8 and 2.3	Updated Reference documents which include supporting JCS work packages, test plans, and sampling analysis plans.	
Page 8; Step 2.4.1	Established new duration limit for phase II of the process test based on WRSS engineering and deleted cog engineer approval (cog is member of JTRG)	
Page 8; Step 2.4.3	Inserted text to emphasize that the intenet is to control VOC emissions throughout process test	
Page 9; Step 3.3	Added Second bullet for notification to ECO for exceeding 50 ppm NOC limit at 241-AZ-702 exhaust stack	
Page 10; Step 3.4	Established new action limits and actions for phase II of the process test based on WRSS engineering and IH recommendations and lessons learned	
Page 11; Step 4.2	Updated performance documents which include supporting JCS work packages, test plans, and sampling analysis plans.	
Page 12; New Step	Inserted prerequisite to contact meterological station for weather forecast	
Page 13; Step 5.1.1, 5.1.3, 5.1.5, & 5.1.6	Updated supporting JCS work package references and procedural work step references due to PCAs to those supporting procedures	
Page 14; Inserted new step prior to step 5.2.1.2	Established new action limit and actions based on WRSS Engineering and IH recommendations and lessons learned	
Page 14; Steps 5.2.1 and 5.2.1.2	Clarified action statements and established new action limits and actions based on WRSS Engineering and IH recommendations and lessons learned	
Page 14; Inserted new step and limits	Established new action limit and actions based on WRSS Engineering	

Page 14; Inserted new steps and notes prior to Step 5.2.1.4	Established new notes and procedural steps based on WRSS Engineering and IH recommendations and lessons learned	
Page 14; Step 5.2.1.4	Added secondary procedure step for recording operation time and VOCs ppm	
Page 14; Inserted new steps after step 5.2.1.4	Added option to control recirculation heater operation	
Page 15; Inserted New section prior to 5.3	Inserted new section providing instructions for stabilizing volatile organic emissions	
Pages 16 and 17; Sections 5.3 and 5.4	Established new action limits and actions for phase II of the process test based on WRSS engineering and IH recommendations and lessons learned and inserted notes as necessary for clarification	
Pages 19 through 21	Modified Table 1, Modified Table 2, Added Data Sheet 1, and Added Data Sheet 2 to facilitate operations during PHASE II of the process test and make them consistent with newly established limits and modes of operation	

PROCEDURE HISTORY SIGNATURE SHEET (Cont.)

Last Full Revision: A-0
Release Date: 12/13/98
USQ Screening Number: TF-98-1248, Rev 0
Approval Designator: ESQ

Current Modification: A-3
USQ Screening Number: TF-98-1201, Rev 1
Approval Designator: N/A
PCA Incorporated: ETF-99-216

POSITION/ORG	DELEGATE	DATE
LNCO/WRSS	Charles Peake	3/16/99
Manager/WRSS	J.E. Andrews	3/16/99
Cog Engineer/WRSS	J.M. Jones	3/16/99
Acceptance Review	L. Ross	3/18/99
Approval Authority	K.J. Anderson	3/17/99

Justification: Editorial corrections and step clarifications.

Summary of Changes:

Page 1: Updated title from Phase II to Phase III.
Page 3: Updated work package numbers in step 1.2.
Page 4: Updated work package numbers in step 2.2.5
Page 5: Updated work package numbers in step 2.2.7,2.2.8,2.3.
Page 5: Added first bullet to step 2.3.
Page 9: Updated work package numbers in step 4.
Page 10: Updated work package numbers in step 4.3.1.
Page 11: Updated work package numbers in step 5.1.3, 5.1.6.
Page 13: Updated work package numbers in step 5.2.1.5 and deleted step 5.2.1.9.
Page 16: Updated work package numbers in step 5.5.1.
Page 5: Deleted 4th from bottom bullet in step 2.3.
Pages 6,7 and 12: Changed duration from 20 hrs. to 13 hrs.
Pages 2 and 17: Deleted Table 1 and made Table 2 to be Table 1.
Pages 2,18 and 19: Deleted Data Sheet 1 and made Data Sheet 2 to be Data Sheet 1.
Page 13: Added note to coordinate sampling with heater operation.

Aw [illegible]
[illegible]
[illegible]ler due to Ambient
[illegible] 40°F Sign Awoke
[illegible]
CWP-1 with

check-chiller status
[illegible]arms—Murphy/Murphy

check-no changes & No
[illegible]urphy/Murphy

[illegible]k-No New Alarms-Murphy
[illegible]ck-No New Alarms-Murphy
[illegible]k-H the Electrical Skid
Alarm on AWN-0621.
[illegible]ger, high, high (AAHH-)0621
[illegible] Alarm caused by testing
[illegible]A complete by EF-1 ppb.
[illegible]ied. Murphy/Murphy
check-No New Alarms
Murphy/Murphy
P-16 exhaustor
[illegible]-006 exhaustor
[illegible]ssor #2 shutdown from
[illegible]. Reset and restarted
[illegible]
[illegible]larm #26 comp 2
Notified DST DRJones
[illegible]nd reset
[illegible] #26 again
[illegible]pressor switch and
[illegible] to come [illegible] DRJones

3-27-99 Reviewed LOG and ALARM STATUS BKNorris SKohn

3-28-99

1002 pumps have been positioned for C-Farm and AY-Farm.
1015- Raising 106-C ensof
1050- CPO starting baseline sample.
1100- Started AY pumping to 106-C.
1106- 2ppm out of C-106
1107 -
1111 C-farm Booster pump started
1113 C-106 stack VOC 3 ppm
1115 DAS FI_13616B_H + FI_13616B_L Disabled FI_D623A_L enabled
1118 C-106 stack VOC 3ppm
1123 C-farm stack VOC 4.1 ppm
1128 C-106 stack V.O.C. 5 ppm
1133 C-106 stack V.O.C. 5.6 ppm
1138 C-106 stack V.O.C. 5.4 ppm
1143 C-106 stack V.O.C 5.5 ppm
1148 C-106 stack V.O.C 6.1 ppm
1153 C-106 stack V.O.C 6.9 ppm
1158 C-106 stack VOC 7.5 ppm
1203 C-106 stack V.O.C. 8.2 ppm
1205 AY-102 Booster Pump started
1213 C-106 stack V.O.C. 11.0 ppm
1219 C-106 stack V.O.C 13.1 ppm
1223 C-106 stack V.O.C 15.6 ppm
1228 C-106 stack V.O.C. 17.6 ppm
1233 C-106 stack V.O.C 19.3 ppm
1238 C-106 stack V.O.C 21.6 ppm
1243 C-106 stack V.O.C 23.6 ppm
1248 C-106 stack V.O.C. 25.6 ppm
1253 C-106 stack V.O.C 27.3 ppm
1258 C-106 stack V.O.C 29.6 ppm
1302 C-106 stack V.O.C 30.1 ppm

3-28-99 cont

	1308	C-106	Stack	V.O.C	34.8 ppm
	1313	C-106	Stack	V.O.C	37.4 ppm
	1318	C-106	Stack	V.O.C	40.3 ppm
	1323	C-106	Stack	V.O.C	43.3 ppm
	1328	C-106	stack	V.O.C	46.3 ppm
	1333	C-106	stack	VOC	50.1 ppm
	1338	C-106	stack	VOC	53.7 ppm
	1343	C-106	stack	VOC	56.8 ppm
	1348	C-106	stack	VOC	60.0 ppm
	1353	C-106	stack	VOC	64.3 ppm
	1358	C-106	stack	VOC	67.9 ppm
	1404	C-106	stack	VOC	66.8 ppm
	1408	C-106	stack	VOC	74.1 ppm
	1413	C-106	stack	VOC	79.0 ppm
	1418	C-106	stack	VOC	82.7 ppm
1423	~~1423~~	C-106	stack	VOC	84.3 ppm
	1428	C-106	stack	VOC	87.5 ppm
	1433	C-106	stack	VOC	90.2 ppm
	1438	C-106	stack	VOC	93.8 ppm
	1443	C-106	stack	VOC	96.0 ppm
	1448	C-106	Stack	VOC	98.4 ppm
	1450	C-106	Stack	VOC	100 ppm
	1453	C-106	stack	VOC	101 ppm
	1456	Alarm	5-4	Booster	Pump Seal Gas
	1458	C-106	Stack	VOC	103 ppm
	1503	C-106	Stack	VOC	107 ppm
	1508	C-106	Stack	VOC	108 ppm
	1513	C-106	Stack	VOC	110 ppm
	1518	C-106	Stack	VOC	110 ppm
	1518	Alarm	5-4	clear	PCV
		adjusted by	craftsman		
	1528	C-106	Stack	VOC	112 ppm
	1533	C-106	Stack	VOC	112 ppm
	1538	C-106	Stack	VOC	113 ppm
	1543	C-106	Stack	VOC	113 ppm
	1548	C-106	Stack	VOC	115 ppm

tack V.O.C	34.8 ppm		3-28-99 cont		RPP-4743 Rev 0
ch V.O.C	37.4 ppm	1552	C-106 stack VOC	117 ppm	
h V.O.C	40.3 ppm	1558	C-106 stack VOC	117 ppm	disconnecting equip for Cals.
V.O.C.	43.3 ppm	1601	Re-connected equip	117 ppm VOC	stack reading
V.O.C.	46.3 ppm	1607	C-106 stack VOC	118 ppm VOC	
VOC	50.1 ppm	1613	C-106 stack VOC	120 ppm	
VOC	53.7 ppm	1618	C-106 stack VOC	122 ppm	
VOC	56.8 ppm	1621	Removed the tank 241-C-106 Bstr/SBM & Pmps trouble. Both shut down.		
VOC	60.0 ppm	1623	C-106 stack VOC	121 ppm	
VOC	64.3 ppm	1628	C-106 stack VOC	121 ppm	
VOC	67.9 ppm	1633	C-106 stack VOC	123 ppm	
VOC	66.8 ppm	1638	C-106 stack VOC	123 ppm	
VOC	74.1 ppm	1643	C-106 stack VOC	125 ppm	
VOC	79.0 ppm	1648	C-106 stack VOC	124 ppm	
VOC	82.7 ppm	1653	C-106 stack VOC	124 ppm	
VOC	84.3 ppm	1655	Both pump shut down		
VOC	87.5 ppm	1656	Both pump restarted.		
VOC	90.2 ppm	1658	C-106 stack VOC	124 ppm	disconnecting equip for Cal.
VOC	93.8 ppm	1703	VOC equip reconnected C-106 stack VOC 124 ppm.		
VOC	96.6 ppm	1707	C-106 stack VOC	125 ppm	
VOC	98.4 ppm	1713	C-106 stack VOC	125 ppm	
VOC	100 ppm	1715	Both pump shut down		
VOC	101 ppm	1716	Restarted Bstr pump		
Booster Pump Seal Gas		1717	C-106 stack VOC	126 ppm	
VOC	103 ppm	1724	C-106 stack VOC	125 ppm	
VOC	107 ppm	1729	C-106 stack VOC	126 ppm	
OC	108 ppm	1733	C-106 stack VOC	127 ppm	
OC	110 ppm	1738	C-106 stack VOC	127 ppm	
OC	110 ppm	1743	C-106 stack VOC	127 ppm	
lear	PCV	1748	C-106 stack VOC	128 ppm	
Hsman		1753	C-106 stack VOC	127 ppm	
	112 ppm	1758	C-106 stack VOC	127 ppm	
	112 ppm	1803	C-106 stack VOC	125 ppm	
	113 ppm				
	113 ppm				
	115 ppm				

3-28-99 cont

1808 C-106 stack VOC 126 ppm
1810 Bstr pump shut down
1811 Bstr pump re-started
1813 Bstr pump shut down
1814 Bstr pump re-started
1815 Bstr pump shut down - Restarted
Bstr pump shut down and
re started
1816 Bstr pump shut down and restarted
1817 C-106 stack VOC 127 ppm
1819 Bstr pump shut down
1820 Restarted Bstr pump.
1821 Bstr pump shut down
1822 Restarted Bstr pump.
1823 Bstr pump shut down and ~~restarted~~ 24, 31
1824 Restarted Bstr pump
1825 Bstr pump shut down.
1827 Shut down sub. pump Ay still pumping
1828 C-106 stack VOC 129 ppm
1836 WRSS OE requested Ay farm to
shut down pumps
1837 Ay pumps shut down. C-106 stack
VOC 132 ppm. Transfer stop
until drain is complete.
1848 C-106 stack VOC 129 ppm
1852 C-106 stack VOC 127 ppm
1858 C-106 stack VOC 126 ppm.
disconnecting equip.
1902 C-106 stack VOC 123 ppm
reconnected equip.
1906 MO-211 opt leveling winch to
149.5
1908 C-106 stack VOC 120 ppm
1913 C-106 stack VOC 119 ppm
1914 AY Immersible Pump start
1917 C-106 stack VOC 117 ppm

3-28-99 Cont'd

1921 SUB pump restarted
1922 Starting Bsts pump.
1923 C-106 Stack VOC 115 ppm
1928 C-106 stack VOC 114 ppm
1932 C-106 Stack VOC 114 ppm
1937 C-106 Stack VOC 114 ppm
1942 C-106 stack VOC 114 ppm
1943 Sluice @ sweep path 12 in auto mode.
1947 C-106 stack VOC 114 ppm
1953 C-106 stack VOC 114 ppm
1958 C-106 stack VOC 114 ppm Disconnected equip for Cal.
2000 Changed to sweep path 11 in Auto.
2008 C-106 stack VOC 113 ppm equip reconnected. ~~113 pp~~
2007 C-160 Stack VOC 113 ppm
2011 Changing to sweep path # 1 auto
2013 C-106 Stack VOC 113 ppm
2016 Lowering pump to 154.6
208 C-106 Stack VOC 114 ppm
2023 C-106 Stack VOC 114 ppm
2025 Changing sweep path #1 in Auto.
2029 C-106 Stack VOC 117 ppm
2034 C-106 stack VOC 117 ppm
2039 C-106 stack VOC 117 ppm
2045 C-106 stack VOC 116 ppm
2048 C-106 stack VOC 117 ppm
2053 C-106 stack VOC 116 ppm
2059 C-106 STACK VOC 115 ppm
2104 C-106 stack VOC 116 ppm
2113 C-106 stack VOC 115 ppm
2123 C-106 stack VOC 114 ppm
2136 C-106 stack VOC 113 ppm
2145 Starting Routine shut down

A63

3/28/99 Cont

2200 Shutdown C-Farm pumps

Appendix B: Industrial Health and Safety Data Logger Packages

1) Process Test, Phase I data (pages B2 through B22)

2) Process Test, Phase II data (pages B23 through B39)

3) Process Test, Phase III data (pages B40 through B51)

C106 Readings Stack w/ FID 12/16/98

DATA SHEET 5 - EXHAUST STACK 296-C-006 (Sheet 1 of 2)

STEP 5.4	EXHAUST GAS SAMPLE					
5.5.3	Stack Flow Rate from FI-13627A: 350					
5.5.4 5.5.6	Sample Period: 60 minutes			Sample Rate: 1 per minute		
	Sample Start Time: 1500			Sample Stop Time:		
5.5.5	Sample No.	Reading (ppm)	Sample No.	Reading (ppm)	Sample No.	Reading (ppm)
	1	2.34	21	4.71	41	7.36
	2	2.36	22	4.90	42	7.28
	3	2.38	23	4.84	43	7.71
	4	2.30	24	4.74	44	7.63
	5	2.34	25	5.04	45	7.40
	6	2.33	26	5.16	46	7.89
	7	2.84	27	5.25	47	7.85
	8	3.40	28	5.19	48	8.02
	9	3.50	29	5.71	49	7.67
	10	3.25	30	5.91	50	7.80
	11	3.30	31	5.63	51	8.12
	12	3.40	32	5.56	52	8.22
	13	3.61	33	6.05	53	8.33
	14	3.82	34	6.32	54	8.42
	15	4.10	35	6.27	55	8.62
	16	4.20	36	6.63	56	8.49
	17	4.10	37	6.92	57	8.66
	18	4.32	38	6.89	58	8.77
	19	5.20	39	7.01	59	8.90
	20	4.53	40	7.86	60	8.92
5.5.7	Total 1	67.62	Total 2	116.59	Total 3	162.02
	Average [Total 1 + Total 2 + Total 3 ÷ 60]					5.77

COMMENTS:

DATA SHEET 5 - EXHAUST STACK 296-C-006 (Sheet 1 of 2)

STEP 5.4	EXHAUST GAS SAMPLE					
5.5.3	Stack Flow Rate from FI-13627A: 341					
5.5.4	Sample Period: 60 minutes			Sample Rate: 1 per minute		
5.5.6	Sample Start Time: 1614			Sample Stop Time:		
	Sample No.	Reading (ppm)	Sample No.	Reading (ppm)	Sample No.	Reading (ppm)
	1	7.27	21	19.51	41	15.71
	2	8.21	22	19.19	42	16.36
	3	8.19	23	18.83	43	16.68
	4	8.12	24	18.79	44	16.83
changed → Hydrogen cylinder	5	14.23	25	20.34	45	17.34
	6	18.23	26	20.02	46	17.68
	7	16.08	27	18.47	47	17.58
	8	17.23	28	19.44	48	17.10
	9	17.42	29	18.87	49	17.68
5.5.5	10	17.01	30	19.95	50	18.19
	11	16.88	31	19.88	51	18.08
	12	17.82	32	19.58	52	18.19
	13	17.63	33	19.04	53	18.14
	14	17.50	34	18.98	54	challenge
	15	18.63	35	18.93	55	
	16	17.88	36	20.10	56	
	17	18.35	37	19.48	57	
	18	19.34	38	19.88	58	
	19	17.89	39	19.68	59	
	20	18.88	40	19.23	60	
5.5.7	Total 1	~~19.61~~ 321.79	Total 2	388.19	Total 3	225.56
	Average [Total 1 + Total 2 + Total 3 ÷ 60]					17.48

COMMENTS:

53

DATA SHEET 5 - EXHAUST STACK 296-C-006 (Sheet 1 of 2)

STEP 5.4	EXHAUST GAS SAMPLE					
5.5.3	Stack Flow Rate from FI-13627A: 331 SCFM					
5.5.4 5.5.6	Sample Period: 60 minutes			Sample Rate: 1 per minute		
	Sample Start Time: 1713			Sample Stop Time: 1814		
5.5.5	Sample No.	Reading (ppm)	Sample No.	Reading (ppm)	Sample No.	Reading (ppm)
	1	19.35	21	28.98	41	30.02
	2	20.16	22	30.29	42	30.09
	3	21.77	23	30.44	43	30.28
	4	22.23	24	31.00	44	30.86
	5	23.08	25	31.5	45	30.90
	6	24.45	26	32.74	46	31.54
	7	25.13	27	32.61	47	31.28
	8	26.26	28	32.93	48	31.63
	9	27.86	29	32.86	49	31.79
	10	29.75	30	32.75	50	32.45
	11	30.62	31	32.80	51	32.83
	12	31.48	32	33.38	52	32.92
	13	31.54	33	33.80	53	33.71
	14	32.04	34	34.21	54	33.26
	15	32.94	35	33.48	55	32.74
	16	33.64	36	32.76	56	33.58
	17	29.12	37	33.4	57	33.86
	18	28.72	38	33.6	58	33.00
	19	28.86	39	34.08	59	32.49
	20	29.46	40	34.09	60	34.01
5.5.7	Total 1	548.46	Total 2	651.70	Total 3	643.40
	Average [Total 1 + Total 2 + Total 3 ÷ 60]					30.73

COMMENTS:

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DATA SHEET 5 - EXHAUST STACK 296-C-006 (Sheet 1 of 2)

STEP 5.4	EXHAUST GAS SAMPLE					
5.5.3	Stack Flow Rate from FI-13627A: 345 scfm					
5.5.4 5.5.6	Sample Period: 60 minutes			Sample Rate: 1 per minute		
	Sample Start Time: 1819			Sample Stop Time: 1920		
5.5.5	Sample No.	Reading (ppm)	Sample No.	Reading (ppm)	Sample No.	Reading (ppm)
	1	27.4	21	24.02	41	29.16
	2	27.83	22	26.30	42	28.92
	3	29.20	23 shut down	26.42	43	28.96
	4	29.15	24	27.63	44	30.12
	5	29.08	25	27.80	45	30.45
	6	29.11	26	28.14	46	29.46
	7	29.68	27	27.72	47	29.61
	8	29.54	28	27.91	48	29.59
	9	30.83	29	28.28	49	29.60
	10	31.28	30	27.83	50	29.45
	11	31.16	31	28.34	51	29.04
	12	30.89	32	28.69	52	24.80
	13	31.98	33	28.48	53	27.33
	14	30.54	34	29.02	54	27.21
	15	31.82	35	28.71	55	26.13
	16	30.86	36	27.31	56	26.64
	17	30.58	37	28.46	57	27.08
Booster Pump started →	18	30.46	38	29.20	58	27.40
	19	31.32	39	29.43	59	27.22
	20	23.82	40	29.35	60	26.81
5.5.7	Total 1	596.52	Total 2	559.04	Total 3	564.98
	Average [Total 1 + Total 2 + Total 3 ÷ 60]					28.67

COMMENTS:

B5

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DATA SHEET 5 - EXHAUST STACK 296-C-006 (Sheet 1 of 2)

STEP 5.4	EXHAUST GAS SAMPLE					
5.5.3	Stack Flow Rate from FI-13627A: 282					
5.5.4 5.5.6	Sample Period: 60 minutes			Sample Rate: 1 per minute		
	Sample Start Time: 1928			Sample Stop Time: 1942		
5.5.5	Sample No.	Reading (ppm)	Sample No.	Reading (ppm)	Sample No.	Reading (ppm)
	1	24.60	21		41	
	2	24.54	22		42	
	3	24.84	23		43	
	4	25.60	24		44	
	5	25.60	25		45	
	6	25.25	26		46	
	7	26.01	27		47	
	8	25.60	28		48	
	9	26.23	29		49	
	10	26.40	30		50	
	11	26.20	31		51	
	12	25.75	32		52	
	13		33		53	
	14		34		54	
	15		35		55	
	16		36		56	
	17		37		57	
	18		38		58	
	19		39		59	
	20		40		60	
5.5.7	Total 1	306.62	Total 2		Total 3	
	Average [Total 1 + Total 2 + Total 3 ÷ 60] 12					25.55
COMMENTS:						

B6

RPP-4743 Rev 0

INDUSTRIAL HYGIENE DIRECT READING INSTRUMENT SURVEY

☑ Business Sensitive

ADMINISTRATION

Survey ID 98-1639 | Survey Date 16 Dec 98 | Page 1 of 4

Location: Area: 200-E Building: 241-AZ Room: 702-AZ Other: AY/AZ EXH

Company Conducting Operation

Agent/CAS/Limit/Ref.:			IH Procedure(s):
T.O.C N/A	2 ppm for 3 min	HASP	IH-1.4, 1.5 HASP 2.9 #3
NH3 7664-41-7	8 HR TWA 25 ppm	ACGIH	SOP 2.2, 2.3, 2.4, 2.11
CG N/A	25 %	BIO/TSR	HNF-PRO-409, HNF-PRO-1
O_2 N/A	19.5-23.5 %	OSHA	21. LTX-310 MANUAL

Survey Title:

Job Documents:

Work Package No.: 2E-98-02581/W Other:

Requestor (Name, Co., Phone): DAN BISHOP LMHC 373-4639

On-The-Job Contact (Name, Co., Phone): SAME

AUTHORIZATION

Surveyor(s): Pages: 1 thru 4

Name (Please Print): M.L. O'Neal Signature: M.L. O'Neal Date: 16 Dec 98

Project IH: KMBowen Pages: 1 thru 4

Name (Please Print): K-t B Signature: K-t B Date: 12-17-98

Reviewed By: Pages: thru

Name (Please Print): Signature: Date:

Entered Into System By: Date:

CALIBRATION

	Instrument No. 1		Instrument No. 2		Instrument No. 3		Detector Tube Pump	
Instrument	580-B OVM		580-B OVM		SENSIDYNE GASTECH MODEL 800		DRAGER ACCURO	
ID No.	P105		P-150		H002		H004	
Periodic Cal.	2/3/98 – 2/4/99		~~2/4/99~~ 11/23/98 5/23/99		11/18/98 2/18/99		9/28/98 12/28/98	
Battery (Y/N)	Y		Y		N/A			
Lamp/Gain	10.6 ev		10.6 ev		N/A			
Cal. Source ID	8-306-110		8-306-110		N/A			
Cal. Effect./Exp. Date	11/2/98		11/2/98		N/A			
Cal. Source Value	98.3		98.3		N/A			
	Pre Calibration	Post Calibration	Pre Calibration	Post Calibration	Pre Calibration	Post Calibration	Pre Calibration	Post Calibration
Date	16 Dec 98	16 Dec 98	16 Dec 98	17 Dec 98	16 Dec 98	N/A	16 Dec 98	
Time	0730	2045	0740	1010	1100	N/A	1115	
As Found	98.3	98.3	100	98.0	N/A	N/A		
Adjusted To	N/A		98.3		N/A			
DT Leak Check (Y/N)					Y	N/A	Y	
Cal. By Initials	MZO	MZO	MZO	MZO	MZO	N/A	MZO	
Cal. Location (Circle One)	OFC FLD	OFC FLD	OFC FLD	OFC FLD	OFC FLD	OFC FLD	OFC FLD	

Calibrated By:

Name (Please Print) M.L. O'Neal

Calibration Comments:

Detector Tube Chemical / Catalog No. / Lot No./Range

1 NH3 ~~150~~ 70 CH20501 LH-1821 5-70 ppm

2 See comments on page

3 for tube info

A-6001-760 (02/98)

B7

INDUSTRIAL HYGIENE DIRECT READING INSTRUMENT SURVEY (Continued)

☐ Business Sensitive

Survey ID 98-1639 | Survey Date 16 Dec 98 | Page 2 of 4

METEOROLOGY

Time: 1100 | Pressure: 29.79 inHg / mmHg | Wind Speed: 03 MPH

Temperature 36° °F° C | Humidity: 82 % | Wind Direction: W

Comments: ☐ Standard Conditions

WORK PLACE/INSTRUMENT READINGS

Operation/Task C-106 SLUICING

Eng. Controls

Admin Controls

Reading No.	Instrument	Sample Type	Time	Location	Job Activity	Agent	Results/Units
1	OVM	S	1100	702 AZ STACK	C-106	TOC	Ø
2	OVM	S	1135				2ppm
3			1455				Ø
4			1505				Ø
5			1521				Ø
6			1621				Ø
7			1854				Ø
8			1956				Ø
9	DRAGER		1207			NH_3	5ppm
10			1555			NH_3	5ppm
11			1753			NH_3	5ppm
12			1855			NH_3	0ppm
13			1958			NH_3	5ppm

Comments: (Name / ID / Job Title / PPE / Reading No.)

SEE DOWNLOADED DATA FOR OVM READING OF INSTRUMENT # P155 + P150 AUTO LOG DATA POINTS. MZO

INDUSTRIAL HYGIENE DIRECT READING INSTRUMENT SURVEY (Continued)

☐ Business Sensitiv

Survey ID 98-1639 | Survey Date 16 Dec 98 | Page 3 of 4

METEOROLOGY

Time: | Pressure: inHg mmHg | Wind Speed: MPH

Temperature °F °C | Humidity: % | ~~Wind Direction:~~

Comments: ☐ Standard Conditions See page 2

WORK PLACE/INSTRUMENT READINGS

Operation/Task C-106 Test

Eng. Controls

Admin Controls

Reading No.	Instrument	Sample Type	Time	Location	Job Activity	Agent	Results/Uni
14	SENSIDYNE GASTECH 800	S	1200	702 AZ STACK	C-106 TEST	SO_2	Ø
15	↓	↓	↓	↓	↓	Amines	Ø
16						HCHO	Ø
17						H_2S	Ø
18			↓	↓	↓	NO_x	Ø
19			1555			SO_2	0.2 ppm
20			↓			Amines	10 ppm
21						HCHO	Ø
22						H_2S	Ø
23			↓			NO_2	Ø
24			1753			SO_2	0.2 ppm
25			↓			Amines	10 ppm
26						HCHO	Ø
27						H_2S	Ø
28			↓			NO_2	Ø
29			1855			SO_2	Ø
30			↓			Amines	Ø
31						HCHO	Ø
32						H_2S	Ø
33	↓	↓	↓	↓	↓	NO_2	Ø

Comments: (Name / ID / Job Title / PPE / Reading No.)

SENSIDYNE DETECTOR TUBES USED.

CHEMICAL	CATALOG #	LOT # (QC#)	RANGE
SO_2	5LB	80716	0.05-10 ppm
Amines	180L	80409	0.5-10 ppm
HCHO	91L	80632	0.1-32.5 ppm
H_2S	4LL	60183	0.25-120 ppm
NO_2	11L	80461	0.04-16.5 ppm

RPP-4743 Rev 0

INDUSTRIAL HYGIENE DIRECT READING INSTRUMENT SURVEY (Continued)

☐ Business Sensitiv

Survey ID 98-1639 | Survey Date 16 Dec 98 | Page 4 of 4

METEOROLOGY

Time:	Pressure: inHg / mmHg	~~Wind Speed:~~ MPH
Temperature °F °C	Humidity: %	Wind Direction:

Comments: ☐ Standard Conditions

See Page 2

WORK PLACE/INSTRUMENT READINGS

Operation/Task

Eng. Controls

Admin Controls

Reading No.	Instrument	Sample Type	Time	Location	Job Activity	Agent	Results/Unit
34	SENSIDYNE GAS TECH 900	S	1958	702 AZ STACK	C-106 TEST	SO_2	0.2 ppm
35	↓	↓	↓	↓	↓	Amines	10 ppm
36						HCHO	Ø
37						H_2S	Ø
38	↓	↓	↓	↓	↓	NO_2	Ø

Comments: (Name / ID / Job Title / PPE / Reading No.)

See page #3 for Tube Information MZ

RPP-4743 Rev 0

702 AZ #1

580 VER. 1.5

??/??/?? ????
INSTRUMENT # 686241
USER I.D. # 000000241
OPERATING MODE: CONC. METER

Started ~ 1100 (am) 12/16/98

Datalogging @ 1 minute interval

OUM 580B
P105

	LOC.	PPM	STATUS
??/??/?? ????	000105	00.0	
??/??/?? ????	000106	00.0	
??/??/?? ????	000107	00.0	
??/??/?? ????	000108	00.0	
??/??/?? ????	000109	00.0	
??/??/?? ????	000110	00.0	
??/??/?? ????	000111	00.0	
??/??/?? ????	000112	00.0	
??/??/?? ????	000113	00.0	
??/??/?? ????	000114	00.0	
??/??/?? ????	000115	00.0	
??/??/?? ????	000116	00.0	
??/??/?? ????	000117	00.0	
??/??/?? ????	000118	00.0	
??/??/?? ????	000119	00.0	
??/??/?? ????	000120	00.0	
??/??/?? ????	000121	00.0	
??/??/?? ????	000122	00.0	
??/??/?? ????	000123	00.0	
??/??/?? ????	000124	00.0	
??/??/?? ????	000125	00.0	
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??/??/?? ????	000128	00.0	
??/??/?? ????	000129	00.0	
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??/??/?? ????	000137	00.0	
??/??/?? ????	000138	00.0	
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??/??/?? ????	000147	00.0	
??/??/?? ????	000148	00.0	
??/??/?? ????	000149	00.0	
??/??/?? ????	000150	00.0	

??/??/?? ????	000151	00.0
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??/??/?? ????	000153	00.0
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??/??/?? ????	000155	00.0
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??/??/?? ????	000160	00.0
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??/??/?? ????	000195	00.0
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??/??/?? ????	000227	00.0
??/??/?? ????	000228	00.0
??/??/?? ????	000229	00.0
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??/??/?? ????	000257	00.0
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??/??/?? ????	000262	00.0

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??/??/??	????	000308	00.0
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??/??/?? ????	000347	00.0
??/??/?? ????	000348	00.0
??/??/?? ????	000349	00.0
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??/??/?? ????	000359	00.0
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??/??/?? ????	000364	00.0
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??/??/?? ????	000367	00.0
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??/??/?? ????	000371	00.0
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??/??/?? ????	000374	00.0

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??/??/?? ????	000376	00.0
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??/??/?? ????	000398	00.0
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??/??/?? ????	000400	00.0
??/??/?? ????	000401	00.0
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??/??/?? ????	000407	00.0
??/??/?? ????	000408	00.0
??/??/?? ????	000409	00.0
??/??/?? ????	000410	00.0
??/??/?? ????	000411	00.0
??/??/?? ????	000412	00.0
??/??/?? ????	000413	00.0
??/??/?? ????	000414	00.0
??/??/?? ????	000415	00.0
??/??/?? ????	000416	00.0
??/??/?? ????	000417	00.0
??/??/?? ????	000418	00.0
??/??/?? ????	000419	00.0
??/??/?? ????	000420	00.0
??/??/?? ????	000421	00.0
??/??/?? ????	000422	00.0
??/??/?? ????	000423	00.0
??/??/?? ????	000424	00.0
??/??/?? ????	000425	00.0
??/??/?? ????	000426	00.0
??/??/?? ????	000427	00.0
??/??/?? ????	000428	00.0
??/??/?? ????	000429	00.0
??/??/?? ????	000430	00.0

RPP-4743 Rev 1

702 A2 #2

monitoring w/ OVM from Stack monitoring Room in 702 A2 Bldg (organic probe)

580 VER. 2.2

OVM 580-B
P-150

Previous Data

05/21/96 1634
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
05/21/96 1634	000101	98.0	

05/24/96 0719
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
05/24/96 0719	000102	98.8	

05/28/96 0738
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
05/28/96 0738	000103	98.3	

05/29/96 0725
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
05/29/96 0725	000104	98.6	

06/03/96 0726
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
06/03/96 0726	000105	98.9	

06/04/96 0724
INSTRUMENT # 027255

B18

USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
06/04/96	0724	000106	98.5
06/05/96	0716	000107	98.5

06/06/96 0722
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
06/06/96	0722	000108	98.0

Previous Data

06/07/96 0735
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
06/07/96	0735	000109	98.5

06/11/96 0704
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
06/11/96	0704	000110	98.2

06/12/96 0721
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
06/12/96	0721	000111	98.7

06/13/96 0727
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
06/13/96	0727	000112	98.3

Previous Data

06/14/96 0722
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
06/14/96 0722	000113	97.4	

06/20/96 0735
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
06/20/96 0735	000114	97.9	

??/??/?? ????
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
??/??/?? ????	000116	00.0	

08/12/87 1203
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER, MAX HOLD

	LOC.	PPM	STATUS
08/12/87 1203	000117	0204	ALARM

??/??/?? ????
INSTRUMENT # 027255
USER I.D. # 000000000
OPERATING MODE: CONC. METER

	LOC.	PPM	STATUS
??/??/?? ????	000118	00.0	
??/??/?? ????	000119	00.0	

??/??/?? ????
INSTRUMENT # 027255

Started approximately
12/16/98 2000 hrs (8:00pm)
Instrument set at 10 minute
Increments

USER I.D. # 000000000
OPERATING MODE: CONC. METER

LOC.		PPM	STATUS
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??/??/??	????	000121	01.1
??/??/??	????	000122	00.7
??/??/??	????	000123	01.1
??/??/??	????	000124	00.7
??/??/??	????	000125	01.1
??/??/??	????	000126	00.7
??/??/??	????	000127	01.1
??/??/??	????	000128	00.7
??/??/??	????	000129	00.7
??/??/??	????	000130	00.7
??/??/??	????	000131	01.1
??/??/??	????	000132	00.7
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??/??/??	????	000135	00.7
??/??/??	????	000136	00.7
??/??/??	????	000137	00.7
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??/??/??	????	000141	00.7
??/??/??	????	000142	00.7
??/??/??	????	000143	00.7
??/??/??	????	000144	00.7
??/??/??	????	000145	00.3
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??/??/?? ????	000175	00.7
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??/??/?? ????	000177	00.7
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??/??/?? ????	000179	00.7
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??/??/?? ????	000182	00.7
??/??/?? ????	000183	00.7
??/??/?? ????	000184	00.3
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??/??/?? ????	000186	00.3
??/??/?? ????	000187	00.3
??/??/?? ????	000188	00.7
??/??/?? ????	000189	00.3
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??/??/?? ????	000191	00.3
??/??/?? ????	000192	00.3
??/??/?? ????	000193	01.4
??/??/?? ????	000194	01.1
??/??/?? ????	000195	00.3
??/??/?? ????	000196	00.3
??/??/?? ????	000197	00.3
??/??/?? ????	000198	00.7

Stopped approximately
12:17 9:00 AM

Process Test
Phase II

RPP-4743 Rev 0

INDUSTRIAL HYGIENE DIRECT READING INSTRUMENT SURVEY

☐ Business Sensitive

ADMINISTRATION

Survey ID: 99-0382 | Survey Date: 7MAR99 | Page 1 of 3

Location: Area: 200-E Building: 241-AZ Room: 702-AZ Other: AY/AZ EXH

Company Conducting Operation

Agent/CAS/Limit/Ref.:

TOC	N/A	2PPM FOR 3 MIN.	HASP
NH3	7664	8HR TWA 25PPM	ACGIH
CG	N/A	25%	BIO / TSR
02	N/A	19.5 - 23.5%	OSHA

IH Procedure(s): HASP, HNF-PRO-409

Survey Title: C-106 SLUICING

Job Documents:
Work Package No.: 2E-99-00144 Other: N/A

Requestor (Name, Co., Phone): DAN BISHOP LMHC 373-4639

On-The-Job Contact (Name, Co., Phone): SAME

AUTHORIZATION

Surveyor(s): Pages: 1 thru END
Name (Please Print): M.L. O'NEAL Signature: M.L. O'Neal Date: 3/7/99

Project IH: Pages: 1 thru 3
Name (Please Print): K. BOWEN Signature: [illegible] Date: 3/10/99

Reviewed By: Pages: ____ thru ____
Name (Please Print): Signature: Date:

Entered Into System By: Date:

CALIBRATION

	Instrument No. 1	Instrument No. 2	Instrument No. 3	Detector Tube Pump
Instrument	TE 580EZ	DRAEGER ACCURO	SENSIDYNE GV-100	
ID No.	P-172	H095	H020	
Periodic Cal.	9/17/98	12/14/98	3/3/99	
Battery (Y/N)	Y	N	N	
Lamp/Gain	10.6 eV	N/A	N/A	
Cal. Source ID	8-135-104	LE-1761		
Cal. Effect./Exp. Date	5/18/98	JAN 2000		
Cal. Source Value	100ppm	5-70 ppm		

	Pre Calibration	Post Calibration	Pre Calibration	Post Calibration	Pre Calibration	Post Calibration	Pre Calibration	Post Calibration
Date	3/7/99	3/10/99	3/7/99	→	3/7/99	3/7/99		
Time	0945	0800	1000	2100	1005	2105		
As Found	100ppm	100ppm	N/A	N/A	N/A	N/A		
Adjusted To	N/A		N/A		N/A			
DT Leak Check (Y/N)	N/A	—	Y	Y	Y	Y		
Cal. By Initials	MLP	→						
Cal. Location (Circle One)	(OFC) FLD	(OFC) FLD	OFC (FLD)	OFC (FLD)	OFC (FLD)	OFC (FLD)	OFC FLD	

Calibrated By:
Name (Please Print): M.L. O'NEAL

Calibration Comments:

Detector Tube Chemical / Catalog No. / Lot No./Range
1 NH3 / CH20501 / LE1761 / 5-70ppm
2 SO2 / 5LB / 80716 / 0.05-10ppm
3 NO2 / 11L / 71259 / 0.04-5ppm

A-6001-760 (02/98)

B23

INDUSTRIAL HYGIENE DIRECT READING INSTRUMENT SURVEY (Continued)

☐ Business Sensitive

Survey ID 99-0382 | Survey Date 3/7/99 | Page 2 of 3

METEOROLOGY

Time:	Pressure: inHg mmHg	Wind Speed: MPH
Temperature ° F ° C	Humidity: %	Wind Direction:

Comments: ☐ Standard Conditions

WORK PLACE/INSTRUMENT READINGS

Operation/Task: C-106 SLUCING

Eng. Controls: N/A

Admin Controls: N/A.

Reading No.	Instrument	Sample Type	Time	Location	Job Activity	Agent	Results/Units
1	OVM	S	1142	702-AZ	C-106	TOV	1ppm
2	3	↓	1147	↓	↓	SO_2	0.3ppm
3	3	↓	1152	↓	↓	NO_2	Ø
4	2	↓	1156	↓	↓	NH_3	5ppm
5	3	↓	1530	↓	↓	SO_2	0.3ppm
6	3	↓	1528	↓	↓	NO_2	Ø
7	2	↓	1532	↓	↓	NH_3	5ppm
8	OVM	↓	1502	↓	↓	TOV	Ø
9	OVM	↓	1602	↓	↓	TOV	Ø
10	3	↓	1635	↓	↓	SO_2	0.5ppm
11	3	↓	1631	↓	↓	NO_2	Ø
12	2	↓	1627	↓	↓	NH_3	5ppm
13	OVM	↓	1702	↓	↓	TOV	Ø
14	3	↓	1730	↓	↓	SO_2	0.3ppm
15	3	↓	1734	↓	↓	NO_2	Ø
16	2	↓	1736	↓	↓	NH_3	5ppm
17	OVM	↓	1802	↓	↓	TOV	Ø
18	3	↓	1836	↓	↓	SO_2	0.3ppm
19	3	↓	1832	↓	↓	NO_2	Ø
20	2	↓	1838	↓	↓	NH_3	5ppm
21	OVM	↓	1902	↓	↓	TOV	Ø

Comments: (Name / ID / Job Title / PPE / Reading No.)

INST. # 3 SENSDYNE GV-100

INS. # 2 DRÄGER ACCURRO

INDUSTRIAL HYGIENE DIRECT READING INSTRUMENT SURVEY (Continued)

☐ Business Sensitive

Survey ID 99-0382 | Survey Date 3/7/99 | Page 7 of 3

METEOROLOGY

Time:	Pressure: InHg mmHg	Wind Speed: MPH
Temperature °F °C	Humidity: %	Wind Direction:

Comments: ☐ Standard Conditions

WORK PLACE/INSTRUMENT READINGS

Operation/Task: C-106 SLUCING

Eng. Controls: N/A

Admin Controls: N/A

Reading No.	Instrument	Sample Type	Time	Location	Job Activity	Agent	Results/Units
22	3	S	1933	702-AZ	C-106	SO_2	0.5 ppm
23	3	↓	1929	↓	↓	NO_2	Ø
24	2	↓	1935	↓	↓	NH_3	7 ppm
25	OVM	↓	2003	↓	↓	TOV	Ø
26	3	↓	2029	↓	↓	SO_2	0.3 ppm
27	3	↓	2032	↓	↓	NO_2	Ø
28	2	↓	2034	↓	↓	NH_3	7 ppm

Comments: (Name / ID / Job Title / PPE / Reading No.)

Hanford Surface Observations

7 MAR 1999

Clouds	Date: Year	Date: Month	Date: Day	Hour	Ceiling Height (Hundreds of Feet) UNLMD	Sky Condition X X	Visibility (Miles)	Weather and/or Obstruction to Vision: Weather: THDR & TORDO	Weather: Liquid Precipitation	Weather: Frozen Precipitation	Obstructions	Sea-Level Pressure (MBS)	Dew Point (° F)	Wind: Direction (36 Pts.)	Wind: Speed (MPH)	Station Pressure (Inches)	Dry Bulb (° F)	Wet Bulb (° F)	Relative Humidity (%)	Total Sky Cover	Rain (Inches)	Snow (Water Equivalent Inches)	Snow (Unmelted Inches)	W x Indicator	SOLRAD (Langley's)
	99	03	07	01								1131	26	32	09	29112	41	36	55					8	
				02								1130	26	31	10	29112	41	35	55					8	
				03								1129	27	30	07	29112	41	35	58					8	
				04								1129	26	30	09	29112	40	35	57					8	
				05								1130	26	30	07	29112	40	34	56					8	
				06	100	8	150					1125	24	31	09	29110	39	33	55	10					
7				07	100	8	150					1128	25	31	10	29111	38	33	58	10					
				08	100	8	150					1130	26	31	08	29112	38	34	61	10					.06
				09	100	5	150					1131	24	30	07	29112	42	35	49	06					.21
7				10		2	150					1130	24	03	04	29112	46	37	44	08					.58
				11		2	150					1130	25	17	04	29112	47	38	41	01					.77
				12		2	150					1123	27	16	07	29110	49	40	42	02					.87
4				13		2	150					1116	26	20	08	29108	50	40	39	05					.75
				14	060	5	150					1115	25	16	05	29108	50	40	38	08					.53
				15								1113	26	14	03	29107	52	41	36					8	
				16								1109	26	09	06	29106	52	41	36					8	.34
				17								1108	27	11	08	29106	50	41	39					8	.19
				18								1107	25	15	09	29105	48	39	41					8	.05
				19								1104	27	15	09	29106	40	35	58					8	
				20								1101	26	15	09	29106	39	34	60					8	
				21								1100	27	14	06	29106	39	34	60					8	
				22								1100	25	15	07	29106	40	34	54					8	
				23								1108	24	14	02	29105	34	31	66					8	
				24			150					1108	24	15	04	29105	32	29	71	90					

71/36 1232 57 82 463

KPF-4745 Rev

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DATA SHEET 5 - EXAUST STACK
EXAUST STACK SAMPLE Pg. 1of2
Continued

0000000192	03/07/99 19:41:05	218
0000000193	03/07/99 19:42:05	222
0000000194	03/07/99 19:43:05	225
0000000195	03/07/99 19:44:05	226
0000000196	03/07/99 19:46:53	229
0000000197	03/07/99 19:47:53	228

DATA SHEET 5 - EXAUST STACK
EXAUST STACK SAMPLE Pg. 1of2
Continued

0000000198	03/07/99 19:48:53	228
0000000199	03/07/99 19:49:53	227
0000000200	03/07/99 19:50:53	227
0000000201	03/07/99 19:51:53	226
0000000202	03/07/99 19:52:53	227
0000000203	03/07/99 19:53:53	226
0000000204	03/07/99 19:54:53	228
0000000205	03/07/99 19:55:53	230
0000000206	03/07/99 19:56:53	231
0000000207	03/07/99 19:57:53	232
0000000208	03/07/99 19:58:53	232
0000000209	03/07/99 19:59:53	233
0000000210	03/07/99 20:00:53	233
0000000211	03/07/99 20:01:53	233
0000000212	03/07/99 20:02:53	232
0000000213	03/07/99 20:03:53	233
0000000214	03/07/99 20:04:53	232
0000000215	03/07/99 20:05:53	231
0000000216	03/07/99 20:06:53	232
0000000217	03/07/99 20:07:53	231
0000000218	03/07/99 20:08:53	232
0000000219	03/07/99 20:09:53	234
0000000220	03/07/99 20:10:53	232
0000000221	03/07/99 20:11:53	232
0000000222	03/07/99 20:12:53	233
0000000223	03/07/99 20:13:53	232
0000000224	03/07/99 20:14:53	232
0000000225	03/07/99 20:15:53	232
0000000226	03/07/99 20:16:53	232
0000000227	03/07/99 20:17:53	231
0000000228	03/07/99 20:18:53	232
0000000229	03/07/99 20:19:53	232
0000000230	03/07/99 20:20:53	232
0000000231	03/07/99 20:21:53	232
0000000232	03/07/99 20:22:53	232
0000000233	03/07/99 20:23:53	231
0000000234	03/07/99 20:24:53	231
0000000235	03/07/99 20:25:53	230
0000000236	03/07/99 20:26:53	229
0000000237	03/07/99 20:27:53	230
0000000238	03/07/99 20:28:54	229
0000000239	03/07/99 20:29:54	228
0000000240	03/07/99 20:30:54	227
0000000241	03/07/99 20:31:54	226
0000000242	03/07/99 20:32:54	226
0000000243	03/07/99 20:33:54	226
0000000244	03/07/99 20:34:54	226
0000000245	03/07/99 20:35:54	225
0000000246	03/07/99 20:36:54	224
0000000247	03/07/99 20:37:54	223
0000000248	03/07/99 20:38:54	222
0000000249	03/07/99 20:39:54	221

DATA SHEET 5 - EXAUST STACK
EXAUST STACK SAMPLE Pg. 1of2
Continued

0000000250	03/07/99 20:40:54	221
0000000251	03/07/99 20:41:54	220

DATA SHEET 5 - EXAUST STACK
EXAUST STACK SAMPLE Pg. 2of2

0000000252	03/07/99 20:42:54	39.4
0000000253	03/07/99 20:43:54	38.2
0000000254	03/07/99 20:44:54	59.0

DATA SHEET 5 - EXHAUST STACK 296-C-006 (Sheet 2 of 2)

STEP 5.5	EXHAUST GAS SAMPLE		
5.5.8	CALIBRATION DRIFT DETERMINATION		
	Item	Low-level Gas	Mid-Level Gas
	Calibration Gas Value (ppm)	29.9	49.1
	Calibration Error (ppm)	Refer to Data Sheet 2	
	Calibration Drift (ppm)	38.7	59.0
	Acceptable Range: ±25% (ppm)	± 7.5	± 12.3
	Test Result (Pass is within Acceptable Range)	Pass / (Fail)	(Pass) / Fail
5.5.9	NOTE: If calibration drift is not within acceptable range, then sample data are invalid and authorization to proceed is required before repeating sample measurements. Authorization to Proceed: Cog Engr: _____ Date _____ Time _____		
	COMMENTS: Per NOTE ABOVE There was NO Need for Signature due to The Fact That The monitoring of The EXHAUST Stack Had Ended.		
5.5.10	Randy Horner (IH&S Tech)	Randy Horner (Signature)	3-9-99 2040 (Date/Time)

DATA SHEET 6 - EXHAUST STACK 296-C-006

STEP 5.7	SAMPLE DATA EVALUATION & RESULTS	
	Item	Concentration (ppm)
5.7.1	Average TOC Reading (Data Sheet 5)	122
5.7.2	Average TOC concentration (C_o)	122
5.7.3	Average Background (Data Sheet 4)	3.7
5.7.4	Average Background Concentration (B_o)	3.7
5.7.5	Background Adjusted Emission (C_o - B_o)	118.3
5.7.6	Approval Condition Emission Limit	50
	NOTE: If background adjusted emission exceeds Approval Condition Emission Limit, then notify Cognizant Engineer immediately. Cog Engr: _____ Date _____ Time _____	
	COMMENTS: Calculations are based on non error related readings - see attached print-out. Gmc 3-11-99	
5.7.7	Dell Spaulding (IH&S Tech) Dell F Spaulding (Signature) 4-9-99 / 7:00 AM (Date/Time)	

DATA POINT	DATE	TIME	ORG CONC (PPM)	
0000000028	3/7/99	13:24:41	5.6	C-006 Stack Exhaust Reading. Slucing Started at 13:24
0000000029	3/7/99	13:25:41	6	
0000000030	3/7/99	13:26:41	4.9	
0000000031	3/7/99	13:27:41	5	
0000000032	3/7/99	13:28:41	5	
0000000033	3/7/99	13:29:41	5.2	
0000000034	3/7/99	13:30:41	10.8	Instrument error caused by radio interference
0000000034	3/7/99	13:30:41		FLAME OUT *
0000000035	3/7/99	13:32:55	4.9	Instrument Restarted
0000000036	3/7/99	13:33:55	16.3	Suspected radio interference
0000000037	3/7/99	13:34:55	5	
0000000038	3/7/99	13:35:55	4.9	
0000000039	3/7/99	13:36:55	11.2	Suspected radio interference
0000000040	3/7/99	13:37:55	5.4	
0000000041	3/7/99	13:38:55	5.4	
0000000042	3/7/99	13:39:55	5.4	
0000000043	3/7/99	13:40:55	5.3	
0000000044	3/7/99	13:41:55	5.3	
0000000045	3/7/99	13:42:55	5.2	
0000000046	3/7/99	13:43:55	5.2	
0000000047	3/7/99	13:44:55	5.3	
0000000048	3/7/99	13:45:55	5.2	
0000000049	3/7/99	13:46:55	5.2	
0000000050	3/7/99	13:47:55	5.2	
0000000051	3/7/99	13:48:55	5.2	
0000000052	3/7/99	13:49:55	5.3	
0000000053	3/7/99	13:50:55	5.3	
0000000054	3/7/99	13:51:55	5.2	
0000000055	3/7/99	13:52:55	5.4	
0000000056	3/7/99	13:53:55	5.4	
0000000057	3/7/99	13:54:55	5.4	
0000000058	3/7/99	13:55:55	5.8	
0000000059	3/7/99	13:56:55	5.4	
0000000060	3/7/99	13:57:55	5.4	
0000000061	3/7/99	13:58:55	5.4	
0000000062	3/7/99	13:59:55	5.3	
0000000063	3/7/99	14:00:55	5.4	
0000000064	3/7/99	14:01:55	5.2	
0000000065	3/7/99	14:02:55	5.5	
0000000066	3/7/99	14:03:55	5.3	
0000000067	3/7/99	14:04:55	4.8	
0000000068	3/7/99	14:05:55	5.5	
0000000069	3/7/99	14:06:55	5.6	
0000000070	3/7/99	14:07:55	6.3	
0000000071	3/7/99	14:08:55	5.8	
0000000072	3/7/99	14:09:56	5.7	
0000000073	3/7/99	14:10:56	6.5	
0000000074	3/7/99	14:11:56	7	
0000000075	3/7/99	14:12:56	7	
0000000076	3/7/99	14:13:56	7	
0000000077	3/7/99	14:14:56	7.4	
0000000078	3/7/99	14:15:56	7.3	

DATA POINT	DATE	TIME	ORG CONC (PPM)	
0000000079	3/7/99	14:16:56	7.2	
0000000080	3/7/99	14:17:56	8.4	
0000000081	3/7/99	14:18:56	8.6	
0000000082	3/7/99	14:19:56	8.3	
0000000083	3/7/99	14:20:56	8.7	
0000000084	3/7/99	14:21:56	8.4	
0000000085	3/7/99	14:22:56	8.6	
0000000086	3/7/99	14:23:56	8.7	
0000000087	3/7/99	14:24:56	8.9	
0000000088	3/7/99	14:25:56	9.4	
0000000089	3/7/99	14:26:13	9.5	
0000000090	3/7/99	14:26:14	9.5	
0000000091	3/7/99	14:27:15		Calibration Verification
0000000092	3/7/99	14:28:15		Calibration Verification
0000000093	3/7/99	14:29:15		Calibration Verification
0000000094	3/7/99	14:30:15	10.5	Reconnect to Stack
0000000095	3/7/99	14:31:15	10.8	
0000000096	3/7/99	14:32:15	11.1	
0000000097	3/7/99	14:33:15	11.5	
0000000098	3/7/99	14:34:15	11.6	
0000000099	3/7/99	14:35:15	11.9	
0000000100	3/7/99	14:36:15	12	
0000000101	3/7/99	14:37:15	13.1	
0000000102	3/7/99	14:38:15	13.7	
0000000103	3/7/99	14:39:15	14.2	
0000000104	3/7/99	14:40:15	14.7	
0000000105	3/7/99	14:41:15	15.3	
0000000106	3/7/99	14:42:15	15.6	
0000000107	3/7/99	14:43:15	15.9	
0000000108	3/7/99	14:44:15	16.2	
0000000109	3/7/99	14:45:15	16.5	
0000000110	3/7/99	14:46:15	17.1	
0000000111	3/7/99	14:47:15	17.5	
0000000112	3/7/99	14:48:15	17.8	
0000000113	3/7/99	14:49:15	18.3	
0000000114	3/7/99	14:50:15	18.7	
0000000115	3/7/99	14:51:15	19.4	
0000000116	3/7/99	14:52:15	19.8	
0000000117	3/7/99	14:53:15	20.3	
0000000118	3/7/99	14:54:15	20.6	
0000000119	3/7/99	14:55:15	21.1	
0000000120	3/7/99	14:56:15	21.7	
0000000121	3/7/99	14:57:15	22.1	
0000000122	3/7/99	14:58:15	22.3	
0000000123	3/7/99	14:59:15	22.7	
0000000124	3/7/99	15:00:15	23.2	
0000000125	3/7/99	15:01:15	23.7	
0000000126	3/7/99	15:02:15	24.1	
0000000127	3/7/99	15:03:15	24.7	
0000000128	3/7/99	15:04:15	24.8	
0000000129	3/7/99	15:05:15	25.5	
0000000130	3/7/99	15:06:15	25.8	

DATA POINT	DATE	TIME	ORG CONC (PPM)	
0000000131	3/7/99	15:07:15	26.4	
0000000132	3/7/99	15:08:15	27	
0000000133	3/7/99	15:09:15	27.7	
0000000134	3/7/99	15:10:16	28.2	
0000000135	3/7/99	15:11:16	28.8	
0000000136	3/7/99	15:12:16	29.5	
0000000137	3/7/99	15:13:16	30.2	
0000000138	3/7/99	15:14:16	30.8	
0000000139	3/7/99	15:15:16	31.4	
0000000140	3/7/99	15:16:16	32	
0000000141	3/7/99	15:17:16	32.2	
0000000142	3/7/99	15:18:16	32.1	
0000000143	3/7/99	15:19:16	32.6	
0000000144	3/7/99	15:20:16	33.2	
0000000145	3/7/99	15:21:16	34	
0000000146	3/7/99	15:22:16	34.6	
0000000147	3/7/99	15:23:16	35.5	
0000000148	3/7/99	15:24:16	36.4	
0000000149	3/7/99	15:25:16	36.6	
0000000150	3/7/99	15:26:16		Calibration verification
0000000151	3/7/99	15:27:16		Calibration verification
0000000152	3/7/99	15:28:16		Calibration verification
0000000153	3/7/99	15:29:16		Instrument error caused by radio interference
0000000154	3/7/99	15:30:16		Instrument error caused by radio interference
0000000155	3/7/99	15:31:16		Instrument error caused by radio interference
0000000156	3/7/99	15:35:49		Instrument error caused by radio interference
0000000157	3/7/99	15:36:49		Instrument error caused by radio interference
0000000158	3/7/99	15:38:35		Instrument error caused by radio interference
0000000159	3/7/99	15:39:35		Instrument error caused by radio interference
0000000160	3/7/99	15:40:35		Instrument error caused by radio interference
0000000161	3/7/99	15:41:35		Instrument error caused by radio interference
0000000162	3/7/99	15:43:48		Instrument error caused by radio interference
0000000163	3/7/99	15:44:48		Instrument error caused by radio interference
0000000000	3/7/99	15:47:17		Instrument on and reconnected - Purging Line
0000000001	3/7/99	15:48:17	41.8	
0000000002	3/7/99	15:49:17	43.7	
0000000003	3/7/99	15:50:17	44.4	
0000000004	3/7/99	15:51:17	44.8	
0000000005	3/7/99	15:52:17	45	
0000000006	3/7/99	15:53:17	45.5	
0000000007	3/7/99	15:54:17	45.8	
0000000008	3/7/99	15:55:18	46.2	
0000000009	3/7/99	15:56:18	46.8	
0000000010	3/7/99	15:57:18	47.2	
0000000011	3/7/99	15:58:18	47.6	
0000000012	3/7/99	15:59:18	48	
0000000013	3/7/99	16:00:18	48.4	
0000000014	3/7/99	16:01:18	49.1	
0000000015	3/7/99	16:02:18	49.6	
0000000016	3/7/99	16:03:18	50.1	
0000000017	3/7/99	16:04:18	50.5	
0000000018	3/7/99	16:05:18	51	

DATA POINT	DATE	TIME	ORG CONC (PPM)	
0000000019	3/7/99	16:06:18	51.4	
0000000020	3/7/99	16:07:18	51.8	
0000000021	3/7/99	16:08:18	52.2	
0000000022	3/7/99	16:09:18	52.6	
0000000023	3/7/99	16:10:18	53.2	
0000000024	3/7/99	16:11:18	53.7	
0000000025	3/7/99	16:12:18	54	
0000000026	3/7/99	16:13:18	54.3	
0000000027	3/7/99	16:14:18	54.6	
0000000028	3/7/99	16:15:18	55	
0000000029	3/7/99	16:16:18	55.4	
0000000030	3/7/99	16:17:18	56	
0000000031	3/7/99	16:18:18	56.5	
0000000032	3/7/99	16:19:18	57	
0000000033	3/7/99	16:20:18	57.9	
0000000034	3/7/99	16:21:18	58.4	
0000000035	3/7/99	16:22:18	58.9	
0000000036	3/7/99	16:23:18		Instrument error caused by radio interference
0000000037	3/7/99	16:24:18		Instrument error caused by radio interference
0000000000	3/7/99	16:26:31	61	Reconnected instrument to Stack
0000000001	3/7/99	16:27:31		Calibration Verification
0000000002	3/7/99	16:28:31		Calibration Verification
0000000003	3/7/99	16:29:31		Calibration Verification
0000000004	3/7/99	16:30:31	58.7	
0000000005	3/7/99	16:31:31	59.9	
0000000006	3/7/99	16:32:31	61	
0000000007	3/7/99	16:33:31	61.3	
0000000008	3/7/99	16:34:31	61.9	
0000000009	3/7/99	16:35:31	62.4	
0000000010	3/7/99	16:36:31	62.9	
0000000011	3/7/99	16:37:31	63.5	
0000000012	3/7/99	16:38:31	64.3	
0000000013	3/7/99	16:39:31	65	
0000000014	3/7/99	16:40:31	65.9	
0000000015	3/7/99	16:41:31	66	
0000000016	3/7/99	16:42:31	66.3	
0000000017	3/7/99	16:43:31	66.8	
0000000018	3/7/99	16:44:31	67.3	
0000000019	3/7/99	16:45:31	67.8	
0000000020	3/7/99	16:46:31	69.3	
0000000021	3/7/99	16:47:31	70	
0000000022	3/7/99	16:48:31	71.3	
0000000023	3/7/99	16:49:31	72.5	
0000000024	3/7/99	16:50:31	72.8	
0000000025	3/7/99	16:51:31	73.5	
0000000026	3/7/99	16:52:31	74.1	
0000000027	3/7/99	16:53:31	75.5	
0000000028	3/7/99	16:54:31	76.6	
0000000029	3/7/99	16:55:31	78.2	
0000000030	3/7/99	16:56:31	79.4	
0000000031	3/7/99	16:57:31	80	
0000000032	3/7/99	16:58:31	80.5	

DATA POINT	DATE	TIME	ORG CONC (PPM)	
0000000033	3/7/99	16:59:31	84	
0000000034	3/7/99	17:00:31	85	
0000000035	3/7/99	17:01:31	85.4	
0000000036	3/7/99	17:02:31	86.3	
0000000037	3/7/99	17:03:31		680 Disconnected from Stack and TVA hooked up
0000000038	3/7/99	17:04:31		Readings are still from 680. TVA read ~ 240 ppm
0000000039	3/7/99	17:05:31		*IH Techs requested to challenge both instruments with cal gas.*
0000000040	3/7/99	17:06:31		
0000000041	3/7/99	17:07:31	91.4	
0000000042	3/7/99	17:08:31	96.7	TVA-1000 disconnected and 680 HVM reconnected to stack
0000000043	3/7/99	17:09:31	96.7	
0000000044	3/7/99	17:10:31	98	
0000000045	3/7/99	17:11:31	100	
0000000046	3/7/99	17:12:31	102	
0000000047	3/7/99	17:13:31	103	
0000000048	3/7/99	17:14:31	104	
0000000049	3/7/99	17:15:31	105	
0000000050	3/7/99	17:16:31	110	
0000000051	3/7/99	17:17:31	110	
0000000052	3/7/99	17:18:31	111	
0000000053	3/7/99	17:19:31	112	
0000000054	3/7/99	17:20:31	112	
0000000055	3/7/99	17:21:32	113	
0000000056	3/7/99	17:22:32	116	
0000000057	3/7/99	17:23:32	117	
0000000058	3/7/99	17:24:32		Calibration verification with 87.9 ppm and 512 ppm methane gas
0000000059	3/7/99	17:25:32		Calibration verification with 87.9 ppm and 512 ppm methane gas
0000000060	3/7/99	17:26:32		Calibration verification with 87.9 ppm and 512 ppm methane gas
0000000061	3/7/99	17:27:32		Calibration verification with 87.9 ppm and 512 ppm methane gas
0000000062	3/7/99	17:28:32	124	Reconnected to Stack
0000000063	3/7/99	17:29:32	127	
0000000064	3/7/99	17:30:32	127	
0000000065	3/7/99	17:31:32	127	
0000000066	3/7/99	17:32:32	131	
0000000067	3/7/99	17:33:32	134	
0000000068	3/7/99	17:34:32	132	
0000000069	3/7/99	17:35:32	133	
0000000070	3/7/99	17:36:32	135	
0000000071	3/7/99	17:37:32	136	
0000000072	3/7/99	17:38:32	139	
0000000073	3/7/99	17:39:32	138	
0000000074	3/7/99	17:40:32	139	
0000000075	3/7/99	17:41:32	125	
0000000076	3/7/99	17:42:32		Calibration Verification
0000000077	3/7/99	17:43:32		Calibration Verification
0000000078	3/7/99	17:44:32		Calibration Verification
0000000079	3/7/99	17:45:32	144	Reconnected to Stack
0000000080	3/7/99	17:46:32	148	
0000000081	3/7/99	17:47:32	150	
0000000082	3/7/99	17:48:32	152	
0000000083	3/7/99	17:49:32	155	
0000000084	3/7/99	17:50:32	160	

DATA POINT	DATE	TIME	ORG CONC (PPM)	
0000000085	3/7/99	17:51:32	163	
0000000086	3/7/99	17:52:32	160	
0000000087	3/7/99	17:53:32	161	
0000000088	3/7/99	17:54:32	164	
0000000089	3/7/99	17:55:32	166	
0000000090	3/7/99	17:56:32	168	
0000000091	3/7/99	17:57:32	170	
0000000092	3/7/99	17:58:32	171	
0000000093	3/7/99	17:59:32	173	
0000000094	3/7/99	18:00:32	175	
0000000095	3/7/99	18:01:32	177	
0000000096	3/7/99	18:02:32	179	
0000000097	3/7/99	18:03:32	180	
0000000098	3/7/99	18:04:32	181	
0000000099	3/7/99	18:05:32	182	
0000000100	3/7/99	18:06:32	183	
0000000101	3/7/99	18:07:32	184	
0000000102	3/7/99	18:08:32	184	
0000000103	3/7/99	18:09:32	185	
0000000104	3/7/99	18:10:32	186	
0000000105	3/7/99	18:11:32	187	
0000000106	3/7/99	18:12:32	189	
0000000107	3/7/99	18:13:32	191	
0000000108	3/7/99	18:14:32	192	
0000000109	3/7/99	18:15:32	193	
0000000110	3/7/99	18:16:32	193	
0000000111	3/7/99	18:17:32	195	
0000000112	3/7/99	18:18:32	196	
0000000113	3/7/99	18:19:32	197	
0000000114	3/7/99	18:23:04	197	
0000000115	3/7/99	18:24:04	197	
0000000116	3/7/99	18:25:04	198	
0000000117	3/7/99	18:26:04		Calibration verification
0000000118	3/7/99	18:27:04		Calibration verification
0000000119	3/7/99	18:28:04		Calibration verification
0000000120	3/7/99	18:29:04		Calibration verification
0000000121	3/7/99	18:30:04	188	Reconnect to Stack
0000000122	3/7/99	18:31:04	192	
0000000123	3/7/99	18:32:04	194	
0000000124	3/7/99	18:33:04	195	
0000000125	3/7/99	18:34:04	196	
0000000126	3/7/99	18:35:04	197	
0000000127	3/7/99	18:36:04	198	
0000000128	3/7/99	18:37:04	199	
0000000129	3/7/99	18:38:04	201	
0000000130	3/7/99	18:39:04	201	
0000000131	3/7/99	18:40:04	202	
0000000132	3/7/99	18:41:04	202	
0000000133	3/7/99	18:42:04	201	
0000000134	3/7/99	18:43:04	201	
0000000135	3/7/99	18:44:04	202	
0000000136	3/7/99	18:45:04	202	

DATA POINT	DATE	TIME	ORG CONC (PPM)
0000000137	3/7/99	18:46:04	202
0000000138	3/7/99	18:47:04	201
0000000139	3/7/99	18:48:04	202
0000000140	3/7/99	18:49:04	202
0000000141	3/7/99	18:50:04	202
0000000142	3/7/99	18:51:04	202
0000000143	3/7/99	18:52:04	202
0000000144	3/7/99	18:53:04	203
0000000145	3/7/99	18:54:04	203
0000000146	3/7/99	18:55:04	203
0000000147	3/7/99	18:56:04	204
0000000148	3/7/99	18:57:04	205
0000000149	3/7/99	18:58:04	204
0000000150	3/7/99	18:59:04	204
0000000151	3/7/99	19:00:04	204
0000000152	3/7/99	19:01:04	203
0000000153	3/7/99	19:02:04	204
0000000154	3/7/99	19:03:04	204
0000000155	3/7/99	19:04:04	205
0000000156	3/7/99	19:05:04	205
0000000157	3/7/99	19:06:04	205
0000000158	3/7/99	19:07:04	205
0000000159	3/7/99	19:08:04	206
0000000160	3/7/99	19:09:04	206
0000000161	3/7/99	19:10:04	207
0000000162	3/7/99	19:11:04	206
0000000163	3/7/99	19:12:04	206
0000000164	3/7/99	19:13:04	205
0000000165	3/7/99	19:14:04	206
0000000166	3/7/99	19:15:04	206
0000000167	3/7/99	19:16:04	206
0000000168	3/7/99	19:17:04	207
0000000169	3/7/99	19:18:04	207
0000000170	3/7/99	19:19:04	208
0000000171	3/7/99	19:20:04	208
0000000172	3/7/99	19:21:04	209
0000000173	3/7/99	19:22:04	209
0000000174	3/7/99	19:23:04	209
0000000175	3/7/99	19:24:04	209
0000000176	3/7/99	19:25:04	209
0000000177	3/7/99	19:26:05	209
0000000178	3/7/99	19:27:05	210
0000000179	3/7/99	19:28:05	211
0000000180	3/7/99	19:29:05	211
0000000181	3/7/99	19:30:05	212
0000000182	3/7/99	19:31:05	212
0000000183	3/7/99	19:32:05	212
0000000184	3/7/99	19:33:05	213
0000000185	3/7/99	19:34:05	213
0000000186	3/7/99	19:35:05	213
0000000187	3/7/99	19:36:05	213
0000000188	3/7/99	19:37:05	Disconnect from Stack for Calibration Verification

DATA POINT	DATE	TIME	ORG CONC (PPM)	
0000000189	3/7/99	19:38:05		Calibration Verification
0000000190	3/7/99	19:39:05		Calibration Verification
0000000191	3/7/99	19:40:05		Calibration Verification
0000000192	3/7/99	19:41:05	218	Reconnect to Stack
0000000193	3/7/99	19:42:05	222	
0000000194	3/7/99	19:43:05	225	
0000000195	3/7/99	19:44:05	226	
0000000196	3/7/99	19:46:53	229	
0000000197	3/7/99	19:47:53	228	
0000000198	3/7/99	19:48:53	228	
0000000199	3/7/99	19:49:53	227	
0000000200	3/7/99	19:50:53	227	
0000000201	3/7/99	19:51:53	226	
0000000202	3/7/99	19:52:53	227	
0000000203	3/7/99	19:53:53	226	
0000000204	3/7/99	19:54:53	228	
0000000205	3/7/99	19:55:53	230	
0000000206	3/7/99	19:56:53	231	
0000000207	3/7/99	19:57:53	232	
0000000208	3/7/99	19:58:53	232	
0000000209	3/7/99	19:59:53	233	
0000000210	3/7/99	20:00:53	233	
0000000211	3/7/99	20:01:53	233	
0000000212	3/7/99	20:02:53	232	
0000000213	3/7/99	20:03:53	233	
0000000214	3/7/99	20:04:53	232	
0000000215	3/7/99	20:05:53	231	
0000000216	3/7/99	20:06:53	232	
0000000217	3/7/99	20:07:53	231	
0000000218	3/7/99	20:08:53	232	
0000000219	3/7/99	20:09:53	234	
0000000220	3/7/99	20:10:53	232	
0000000221	3/7/99	20:11:53	232	
0000000222	3/7/99	20:12:53	233	
0000000223	3/7/99	20:13:53	232	
0000000224	3/7/99	20:14:53	232	
0000000225	3/7/99	20:15:53	232	
0000000226	3/7/99	20:16:53	232	
0000000227	3/7/99	20:17:53	231	
0000000228	3/7/99	20:18:53	232	
0000000229	3/7/99	20:19:53	232	
0000000230	3/7/99	20:20:53	232	
0000000231	3/7/99	20:21:53	232	
0000000232	3/7/99	20:22:53	232	
0000000233	3/7/99	20:23:53	231	
0000000234	3/7/99	20:24:53	231	
0000000235	3/7/99	20:25:53	230	
0000000236	3/7/99	20:26:53	229	
0000000237	3/7/99	20:27:53	230	
0000000238	3/7/99	20:28:54	229	
0000000239	3/7/99	20:29:54	228	
0000000240	3/7/99	20:30:54	227	

DATA POINT	DATE	TIME	ORG CONC (PPM)	
0000000241	3/7/99	20:31:54	226	
0000000242	3/7/99	20:32:54	226	
0000000243	3/7/99	20:33:54	226	
0000000244	3/7/99	20:34:54	226	
0000000245	3/7/99	20:35:54	225	
0000000246	3/7/99	20:36:54	224	
0000000247	3/7/99	20:37:54	223	
0000000248	3/7/99	20:38:54	222	
0000000249	3/7/99	20:39:54	221	
0000000250	3/7/99	20:40:54	221	
0000000251	3/7/99	20:41:54	220	
0000000252	3/7/99	20:42:54		Disconnect for calibration verification
0000000253	3/7/99	20:43:54		Calibration Verification
0000000254	3/7/99	20:44:54		Calibration Verification
0000000255	3/7/99	20:45:54	199	Reconnect to Stack
0000000256	3/7/99	20:46:54	209	
0000000257	3/7/99	20:47:54	210	
0000000258	3/7/99	20:48:54	212	
0000000259	3/7/99	20:49:54	211	
0000000260	3/7/99	20:50:54	212	
0000000261	3/7/99	20:51:54	212	
0000000262	3/7/99	20:52:54	211	
0000000263	3/7/99	20:53:54	209	
0000000264	3/7/99	20:54:54	209	
0000000265	3/7/99	20:55:54	209	
0000000266	3/7/99	20:57:15	207	
0000000267	3/7/99	20:58:15	207	
0000000268	3/7/99	20:59:15	206	
0000000269	3/7/99	21:00:15	204	
0000000270	3/7/99	21:01:15	204	
0000000271	3/7/99	21:02:15	203	
0000000272	3/7/99	21:03:15	201	
0000000273	3/7/99	21:04:15	199	
0000000274	3/7/99	21:05:15	197	
0000000275	3/7/99	21:06:15	196	
0000000276	3/7/99	21:07:15	195	
0000000277	3/7/99	21:08:15	194	
0000000278	3/7/99	21:09:15	193	
0000000279	3/7/99	21:10:15	192	
0000000280	3/7/99	21:11:15	191	
0000000281	3/7/99	21:12:15	191	
0000000282	3/7/99	21:13:15	190	
0000000283	3/7/99	21:14:15	190	
0000000284	3/7/99	21:15:15	189	
0000000285	3/7/99	21:16:15	188	
0000000286	3/7/99	21:17:15	187	
0000000287	3/7/99	21:18:15	186	
0000000288	3/7/99	21:19:15	184	
0000000289	3/7/99	21:20:15	183	
0000000290	3/7/99	21:21:15	183	
0000000291	3/7/99	21:22:15	182	
0000000292	3/7/99	21:23:15	181	

DATA POINT	DATE	TIME	ORG CONC (PPM)
0000000293	3/7/99	21:24:15	179
0000000294	3/7/99	21:25:15	179
0000000295	3/7/99	21:26:15	179
0000000296	3/7/99	21:27:15	178
0000000297	3/7/99	21:28:15	176
0000000298	3/7/99	21:29:15	176
	SUM		52244.5
	AVE		122.0665888

Process Test Phase III RPP-4743 – Rev 0

C106 SLUICING TEST 3

Instrument: 680 FID
Operators: John McKinney, Del Spaulding, Randy Horner
Calibration Checks: Performed Hourly

DATAPOINT	DATE	TIME	FID READING PPM ORGANICS	
0000000046	3/28/99	11:33	5.2	
0000000047	3/28/99	11:34	5.3	
0000000048	3/28/99	11:35	5.4	
0000000049	3/28/99	11:36	5.5	
0000000050	3/28/99	11:37	5.6	
0000000051	3/28/99	11:38	5.7	
0000000052	3/28/99	11:39	5.6	
0000000053	3/28/99	11:40	5.7	
0000000054	3/28/99	11:41	5.4	
0000000055	3/28/99	11:42	5.6	
0000000056	3/28/99	11:43	5.3	
0000000057	3/28/99	11:44	5.4	
0000000058	3/28/99	11:44	5.3	
0000000059	3/28/99	11:45	5.3	
0000000060	3/28/99	11:46	5.5	
0000000061	3/28/99	11:47	5.4	
0000000062	3/28/99	11:48	5.8	
0000000063	3/28/99	11:49	6.1	
0000000064	3/28/99	11:50	6.1	
0000000065	3/28/99	11:50	6	
0000000066	3/28/99	11:51	6.2	
0000000067	3/28/99	11:52	6.5	
0000000068	3/28/99	11:53	6.9	
0000000069	3/28/99	11:54	7	
0000000070	3/28/99	11:55	6.9	
0000000071	3/28/99	11:56	6.7	
0000000072	3/28/99	11:57	7.1	
0000000073	3/28/99	11:58	7.3	
0000000074	3/28/99	11:59	7.4	
0000000075	3/28/99	12:00	7.3	
0000000076	3/28/99	12:01	7.5	
0000000077	3/28/99	12:02	7.6	
0000000078	3/28/99	12:03	7.9	
0000000079	3/28/99	12:04	8	
0000000080	3/28/99	12:05	8.1	
0000000081	3/28/99	12:06	8.2	
0000000082	3/28/99	12:07	16.4	Disconnected for Calibration Check
0000000083	3/28/99	12:08	2.3	Disconnected for Calibration Check
0000000084	3/28/99	12:09	7.8	
0000000085	3/28/99	12:10	8.3	
0000000086	3/28/99	12:11	9	
0000000087	3/28/99	12:12	9.2	
0000000088	3/28/99	12:13	9.8	
0000000089	3/28/99	12:14	10.6	
0000000090	3/28/99	12:15	11.1	
0000000091	3/28/99	12:16	11.6	
0000000092	3/28/99	12:17	11.8	
0000000093	3/28/99	12:19	12.8	
0000000094	3/28/99	12:20	13.5	

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C106 SLUICING TEST 3

DATAPOINT	DATE	TIME	FID READING PPM ORGANICS
0000000095	3/28/99	12:21	14
0000000096	3/28/99	12:22	14.4
0000000097	3/28/99	12:23	14.6
0000000098	3/28/99	12:24	15
0000000099	3/28/99	12:25	15.4
0000000100	3/28/99	12:26	15.9
0000000101	3/28/99	12:27	16.4
0000000102	3/28/99	12:28	16.9
0000000103	3/28/99	12:29	17.3
0000000104	3/28/99	12:30	17.5
0000000105	3/28/99	12:31	17.8
0000000106	3/28/99	12:32	17.9
0000000107	3/28/99	12:33	18.3
0000000108	3/28/99	12:34	18.6
0000000109	3/28/99	12:35	19.1
0000000110	3/28/99	12:36	19.6
0000000111	3/28/99	12:37	20.1
0000000112	3/28/99	12:38	20.7
0000000113	3/28/99	12:39	21.1
0000000114	3/28/99	12:40	21.4
0000000115	3/28/99	12:41	21.8
0000000116	3/28/99	12:42	22
0000000117	3/28/99	12:43	22.3
0000000118	3/28/99	12:44	23.1
0000000119	3/28/99	12:45	23.6
0000000120	3/28/99	12:46	24.3
0000000121	3/28/99	12:47	24.6
0000000122	3/28/99	12:48	24.9
0000000123	3/28/99	12:49	25.5
0000000124	3/28/99	12:50	25.6
0000000125	3/28/99	12:51	25.6
0000000126	3/28/99	12:52	26.2
0000000127	3/28/99	12:53	26.5
0000000128	3/28/99	12:54	27.1
0000000129	3/28/99	12:55	27.4
0000000130	3/28/99	12:56	27.6
0000000131	3/28/99	12:57	27.8
0000000132	3/28/99	12:58	28.5
0000000133	3/28/99	12:59	28.8
0000000134	3/28/99	13:00	29.6
0000000135	3/28/99	13:01	30
0000000136	3/28/99	13:02	28.6
0000000137	3/28/99	13:03	28.5
0000000138	3/28/99	13:04	30.8
0000000139	3/28/99	13:05	31.6
0000000140	3/28/99	13:06	31.9
0000000141	3/28/99	13:07	32.5
0000000142	3/28/99	13:08	33.2
0000000143	3/28/99	13:09	33.8
0000000144	3/28/99	13:10	34.5
0000000145	3/28/99	13:11	34.7
0000000146	3/28/99	13:12	35.7
0000000147	3/28/99	13:13	36.2
0000000148	3/28/99	13:14	37.2
0000000149	3/28/99	13:15	37.7

BY1

RPP-4743 Rev 0

C106 SLUICING TEST 3

DATAPOINT	DATE	TIME	FID READING PPM ORGANICS	
0000000150	3/28/99	13:16	38.7	
0000000151	3/28/99	13:17	38.8	
0000000152	3/28/99	13:18	39.8	
0000000153	3/28/99	13:19	40	
0000000154	3/28/99	13:20	40.5	
0000000155	3/28/99	13:21	41.5	
0000000156	3/28/99	13:22	42.2	
0000000157	3/28/99	13:23	42.6	
0000000158	3/28/99	13:24	42.7	
0000000159	3/28/99	13:25	43.7	
0000000160	3/28/99	13:26	44.7	
0000000161	3/28/99	13:27	45.2	
0000000162	3/28/99	13:28	45.7	
0000000163	3/28/99	13:29	46.2	
0000000164	3/28/99	13:30	46.7	
0000000165	3/28/99	13:31	47.9	
0000000166	3/28/99	13:32	48.6	
0000000167	3/28/99	13:33	49.1	
0000000168	3/28/99	13:34	49.8	
0000000169	3/28/99	13:35	50.3	
0000000170	3/28/99	13:36	50.5	
0000000171	3/28/99	13:37	51.2	
0000000172	3/28/99	13:38	52.1	
0000000173	3/28/99	13:39	53	
0000000174	3/28/99	13:40	54	
0000000175	3/28/99	13:41	54.5	
0000000176	3/28/99	13:42	55.4	
0000000177	3/28/99	13:43	55.9	
0000000178	3/28/99	13:44	56.3	
0000000179	3/28/99	13:45	56.9	
0000000180	3/28/99	13:46	57.1	
0000000181	3/28/99	13:47	57.6	
0000000182	3/28/99	13:48	58.6	
0000000183	3/28/99	13:49	59.3	
0000000184	3/28/99	13:50	60.4	
0000000185	3/28/99	13:51	60.8	
0000000186	3/28/99	13:52	61.7	
0000000187	3/28/99	13:53	62.5	
0000000188	3/28/99	13:54	62.9	
0000000189	3/28/99	13:55	64.6	
0000000190	3/28/99	13:56	65.2	
0000000191	3/28/99	13:57	66.2	
0000000192	3/28/99	13:58	66.3	
0000000193	3/28/99	13:59	66.8	
0000000194	3/28/99	14:00	68	
0000000195	3/28/99	14:01	68.4	
0000000196	3/28/99	14:02	69.6	
0000000197	3/28/99	14:03	7.1	Disconnected for Calibration Check
0000000198	3/28/99	14:04	4	Disconnected for Calibration Check
0000000199	3/28/99	14:05	47.3	Disconnected for Calibration Check
0000000200	3/28/99	14:06	68.7	
0000000201	3/28/99	14:07	70.6	
0000000202	3/28/99	14:08	71.5	
0000000203	3/28/99	14:09	73	
0000000204	3/28/99	14:10	74.5	

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DATAPOINT	DATE	TIME	FID READING PPM ORGANICS	
0000000205	3/28/99	14:11	75.2	
0000000206	3/28/99	14:12	76.2	
0000000207	3/28/99	14:13	77.6	
0000000208	3/28/99	14:14	78.7	
0000000209	3/28/99	14:15	79.4	
0000000210	3/28/99	14:16	80.6	
0000000211	3/28/99	14:17	81	
0000000212	3/28/99	14:18	81.9	
0000000213	3/28/99	14:19	82.8	
0000000214	3/28/99	14:20	82.6	
0000000215	3/28/99	14:21	82.4	
0000000216	3/28/99	14:22	82.3	
0000000217	3/28/99	14:23	82.9	
0000000218	3/28/99	14:25	84.6	
0000000219	3/28/99	14:26	85.8	
0000000220	3/28/99	14:27	86.4	
0000000221	3/28/99	14:28	87.4	
0000000222	3/28/99	14:29	87.8	
0000000223	3/28/99	14:30	88	
0000000224	3/28/99	14:31	88.8	
0000000225	3/28/99	14:32	89.4	
0000000226	3/28/99	14:33	89.8	
0000000227	3/28/99	14:34	89.9	
0000000228	3/28/99	14:35	90.3	
0000000229	3/28/99	14:36	90.9	
0000000230	3/28/99	14:37	91.3	
0000000231	3/28/99	14:38	92.6	
0000000232	3/28/99	14:39	93.8	
0000000233	3/28/99	14:40	93.8	
0000000234	3/28/99	14:41	94.3	
0000000235	3/28/99	14:42	94.2	
0000000236	3/28/99	14:43	95.5	
0000000237	3/28/99	14:44	95.6	
0000000238	3/28/99	14:45	95.6	
0000000239	3/28/99	14:46	96.2	
0000000240	3/28/99	14:47	96.9	
0000000241	3/28/99	14:48	97.2	
0000000242	3/28/99	14:49	97.9	
0000000243	3/28/99	14:50	98.7	
0000000244	3/28/99	14:51	99.6	
0000000245	3/28/99	14:52	100	
0000000246	3/28/99	14:53	101	
0000000247	3/28/99	14:54	101	
0000000248	3/28/99	14:55	101	
0000000249	3/28/99	14:56	102	
0000000250	3/28/99	14:57	102	
0000000251	3/28/99	14:58	102	
0000000252	3/28/99	14:59	103	
0000000253	3/28/99	15:00	17.3	Disconnected for Calibration Check
0000000254	3/28/99	15:01	4.9	Disconnected for Calibration Check
0000000255	3/28/99	15:02	104	
0000000256	3/28/99	15:03	105	
0000000257	3/28/99	15:04	106	
0000000258	3/28/99	15:05	107	
0000000259	3/28/99	15:06	107	

C106 SLUICING TEST 3

DATAPOINT	DATE	TIME	FID READING PPM ORGANICS
0000000260	3/28/99	15:07	107
0000000261	3/28/99	15:08	107
0000000262	3/28/99	15:09	107
0000000263	3/28/99	15:10	108
0000000264	3/28/99	15:13	109
0000000265	3/28/99	15:14	110
0000000266	3/28/99	15:15	110
0000000267	3/28/99	15:16	110
0000000268	3/28/99	15:17	110
0000000269	3/28/99	15:18	110
0000000270	3/28/99	15:19	110
0000000271	3/28/99	15:20	110
0000000272	3/28/99	15:21	110
0000000273	3/28/99	15:22	111
0000000274	3/28/99	15:23	111
0000000275	3/28/99	15:24	112
0000000276	3/28/99	15:25	112
0000000277	3/28/99	15:26	112
0000000278	3/28/99	15:27	112
0000000279	3/28/99	15:28	112
0000000280	3/28/99	15:29	112
0000000281	3/28/99	15:30	112
0000000282	3/28/99	15:31	112
0000000283	3/28/99	15:34	112
0000000284	3/28/99	15:35	112
0000000285	3/28/99	15:36	113
0000000286	3/28/99	15:37	113
0000000287	3/28/99	15:38	113
0000000288	3/28/99	15:39	113
0000000289	3/28/99	15:40	113
0000000290	3/28/99	15:41	112
0000000291	3/28/99	15:42	113
0000000292	3/28/99	15:43	113
0000000293	3/28/99	15:44	113
0000000294	3/28/99	15:45	113
0000000295	3/28/99	15:46	113
0000000296	3/28/99	15:47	114
0000000297	3/28/99	15:48	114
0000000298	3/28/99	15:49	115
0000000299	3/28/99	15:50	115
0000000300	3/28/99	15:51	115
0000000301	3/28/99	15:52	115
0000000302	3/28/99	15:53	116
0000000303	3/28/99	15:54	116
0000000304	3/28/99	15:55	117
0000000305	3/28/99	15:56	117
0000000306	3/28/99	15:57	117
0000000307	3/28/99	15:58	117
0000000308	3/28/99	15:59	117
0000000309	3/28/99	16:00	117
0000000310	3/28/99	16:01	30.4 Disconnected for Calibration Check
0000000311	3/28/99	16:02	47.3 Disconnected for Calibration Check
0000000312	3/28/99	16:03	115
0000000313	3/28/99	16:04	117
0000000314	3/28/99	16:05	117

C106 SLUICING TEST 3

DATAPOINT	DATE	TIME	FID READING PPM ORGANICS
0000000315	3/28/99	16:06	118
0000000316	3/28/99	16:07	118
0000000317	3/28/99	16:08	118
0000000318	3/28/99	16:09	118
0000000319	3/28/99	16:10	118
0000000320	3/28/99	16:11	118
0000000321	3/28/99	16:12	118
0000000322	3/28/99	16:13	118
0000000323	3/28/99	16:14	119
0000000324	3/28/99	16:15	119
0000000325	3/28/99	16:16	120
0000000326	3/28/99	16:17	121
0000000327	3/28/99	16:18	121
0000000328	3/28/99	16:19	121
0000000329	3/28/99	16:20	121
0000000330	3/28/99	16:21	122
0000000331	3/28/99	16:24	121
0000000332	3/28/99	16:25	121
0000000333	3/28/99	16:26	122
0000000334	3/28/99	16:27	121
0000000335	3/28/99	16:28	120
0000000336	3/28/99	16:29	121
0000000337	3/28/99	16:30	122
0000000338	3/28/99	16:31	121
0000000339	3/28/99	16:32	122
0000000340	3/28/99	16:33	122
0000000341	3/28/99	16:34	122
0000000342	3/28/99	16:35	122
0000000343	3/28/99	16:36	122
0000000344	3/28/99	16:37	122
0000000345	3/28/99	16:38	122
0000000346	3/28/99	16:39	122
0000000347	3/28/99	16:40	122
0000000348	3/28/99	16:41	123
0000000349	3/28/99	16:42	123
0000000350	3/28/99	16:43	123
0000000351	3/28/99	16:44	123
0000000352	3/28/99	16:45	124
0000000353	3/28/99	16:46	125
0000000354	3/28/99	16:47	124
0000000355	3/28/99	16:48	124
0000000356	3/28/99	16:49	124
0000000357	3/28/99	16:50	123
0000000358	3/28/99	16:51	123
0000000359	3/28/99	16:52	123
0000000360	3/28/99	16:53	124
0000000361	3/28/99	16:54	124
0000000362	3/28/99	16:55	124
0000000363	3/28/99	16:56	124
0000000364	3/28/99	16:57	125
0000000365	3/28/99	16:58	124
0000000366	3/28/99	16:59	124
0000000367	3/28/99	17:00	124
0000000368	3/28/99	17:01	124
0000000369	3/28/99	17:02	123

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DATAPOINT	DATE	TIME	FID READING PPM ORGANICS	
0000000370	3/28/99	17:03	124	
0000000371	3/28/99	17:04	50.6	Disconnected for Calibration Check
0000000372	3/28/99	17:05	121	Disconnected for Calibration Check
0000000373	3/28/99	17:06	124	
0000000374	3/28/99	17:07	125	
0000000375	3/28/99	17:08	125	
0000000376	3/28/99	17:09	125	
0000000377	3/28/99	17:10	126	
0000000378	3/28/99	17:11	125	
0000000379	3/28/99	17:12	125	
0000000380	3/28/99	17:13	125	
0000000381	3/28/99	17:14	124	
0000000382	3/28/99	17:15	125	
0000000383	3/28/99	17:16	125	
0000000384	3/28/99	17:17	125	
0000000385	3/28/99	17:18	125	
0000000386	3/28/99	17:19	125	
0000000387	3/28/99	17:20	126	
0000000388	3/28/99	17:21	126	
0000000389	3/28/99	17:22	126	
0000000390	3/28/99	17:23	126	
0000000391	3/28/99	17:24	125	
0000000392	3/28/99	17:25	126	
0000000393	3/28/99	17:26	126	
0000000394	3/28/99	17:27	125	
0000000395	3/28/99	17:28	125	
0000000396	3/28/99	17:29	126	
0000000397	3/28/99	17:30	126	
0000000398	3/28/99	17:31	126	
0000000399	3/28/99	17:32	127	
0000000400	3/28/99	17:33	127	
0000000401	3/28/99	17:34	127	
0000000402	3/28/99	17:35	127	
0000000403	3/28/99	17:36	127	
0000000404	3/28/99	17:37	127	
0000000405	3/28/99	17:38	127	
0000000406	3/28/99	17:39	127	
0000000407	3/28/99	17:40	126	
0000000408	3/28/99	17:41	126	
0000000409	3/28/99	17:42	126	
0000000410	3/28/99	17:46	128	
0000000411	3/28/99	17:47	127	
0000000412	3/28/99	17:48	128	
0000000413	3/28/99	17:49	128	
0000000414	3/28/99	17:50	128	
0000000415	3/28/99	17:51	127	
0000000416	3/28/99	17:52	126	
0000000417	3/28/99	17:53	126	
0000000418	3/28/99	17:54	126	
0000000419	3/28/99	17:55	126	
0000000420	3/28/99	17:56	125	
0000000421	3/28/99	17:57	125	
0000000422	3/28/99	17:58	126	
0000000423	3/28/99	17:59	126	
0000000424	3/28/99	18:00	126	

C106 SLUICING TEST 3

DATAPOINT	DATE	TIME	FID READING PPM ORGANICS	
0000000425	3/28/99	18:01	9.1	Disconnected for Calibration Check
0000000426	3/28/99	18:02	51.2	Disconnected for Calibration Check
0000000427	3/28/99	18:03	124	
0000000428	3/28/99	18:04	125	
0000000429	3/28/99	18:05	125	
0000000430	3/28/99	18:06	125	
0000000431	3/28/99	18:07	125	
0000000432	3/28/99	18:08	125	
0000000433	3/28/99	18:09	126	
0000000434	3/28/99	18:10	126	
0000000435	3/28/99	18:11	126	
0000000436	3/28/99	18:12	126	
0000000437	3/28/99	18:13	126	
0000000438	3/28/99	18:14	127	
0000000439	3/28/99	18:18	127	
0000000440	3/28/99	18:19	127	
0000000441	3/28/99	18:20	127	
0000000442	3/28/99	18:21	127	
0000000443	3/28/99	18:22	127	
0000000444	3/28/99	18:23	128	
0000000445	3/28/99	18:24	128	
0000000446	3/28/99	18:25	128	
0000000447	3/28/99	18:26	128	
0000000448	3/28/99	18:27	129	
0000000449	3/28/99	18:28	128	
0000000450	3/28/99	18:29	128	
0000000451	3/28/99	18:30	128	
0000000452	3/28/99	18:31	129	
0000000453	3/28/99	18:32	132	
0000000454	3/28/99	18:33	130	
0000000455	3/28/99	18:34	130	
0000000456	3/28/99	18:35	130	
0000000457	3/28/99	18:36	131	
0000000458	3/28/99	18:37	131	
0000000459	3/28/99	18:38	131	
0000000460	3/28/99	18:39	132	
0000000461	3/28/99	18:40	132	
0000000462	3/28/99	18:41	132	
0000000463	3/28/99	18:42	132	
0000000464	3/28/99	18:43	132	
0000000465	3/28/99	18:44	131	
0000000466	3/28/99	18:45	130	
0000000467	3/28/99	18:46	131	
0000000468	3/28/99	18:47	130	
0000000469	3/28/99	18:48	130	
0000000470	3/28/99	18:49	130	
0000000471	3/28/99	18:50	130	
0000000472	3/28/99	18:51	129	
0000000473	3/28/99	18:52	128	
0000000474	3/28/99	18:53	128	
0000000475	3/28/99	18:54	128	
0000000476	3/28/99	18:55	127	
0000000477	3/28/99	18:56	127	
0000000478	3/28/99	18:57	126	
0000000479	3/28/99	18:58	127	

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DATAPOINT	DATE	TIME	FID READING PPM ORGANICS	
0000000480	3/28/99	18:59	127	
0000000481	3/28/99	19:00	126	
0000000482	3/28/99	19:01	126	
0000000483	3/28/99	19:02	34.3	Disconnected for Calibration Check
0000000484	3/28/99	19:03	52.4	Disconnected for Calibration Check
0000000485	3/28/99	19:04	120	Disconnected for Calibration Check
0000000486	3/28/99	19:05	124	
0000000487	3/28/99	19:06	121	
0000000488	3/28/99	19:07	121	
0000000489	3/28/99	19:08	121	
0000000490	3/28/99	19:09	121	
0000000491	3/28/99	19:10	120	
0000000492	3/28/99	19:11	120	
0000000493	3/28/99	19:12	120	
0000000494	3/28/99	19:13	120	
0000000495	3/28/99	19:15	119	
0000000496	3/28/99	19:16	118	
0000000497	3/28/99	19:17	117	
0000000498	3/28/99	19:18	116	
0000000499	3/28/99	19:19	116	
0000000500	3/28/99	19:20	117	
0000000501	3/28/99	19:21	117	
0000000502	3/28/99	19:22	116	
0000000503	3/28/99	19:23	115	
0000000504	3/28/99	19:24	115	
0000000505	3/28/99	19:25	115	
0000000506	3/28/99	19:26	115	
0000000507	3/28/99	19:27	115	
0000000508	3/28/99	19:28	114	
0000000509	3/28/99	19:29	114	
0000000510	3/28/99	19:30	113	
0000000511	3/28/99	19:31	113	
0000000512	3/28/99	19:32	113	
0000000513	3/28/99	19:33	112	
0000000514	3/28/99	19:34	112	
0000000515	3/28/99	19:35	113	
0000000516	3/28/99	19:36	112	
0000000517	3/28/99	19:37	113	
0000000518	3/28/99	19:38	114	
0000000519	3/28/99	19:39	113	
0000000520	3/28/99	19:40	113	
0000000521	3/28/99	19:41	113	
0000000522	3/28/99	19:42	113	
0000000523	3/28/99	19:43	113	
0000000524	3/28/99	19:44	113	
0000000525	3/28/99	19:45	113	
0000000526	3/28/99	19:46	113	
0000000527	3/28/99	19:47	113	
0000000528	3/28/99	19:48	113	
0000000529	3/28/99	19:49	113	
0000000530	3/28/99	19:50	114	
0000000531	3/28/99	19:51	113	
0000000532	3/28/99	19:53	114	
0000000533	3/28/99	19:54	114	
0000000534	3/28/99	19:55	114	

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C106 SLUICING TEST 3

DATAPOINT	DATE	TIME	FID READING PPM ORGANICS	
0000000535	3/28/99	19:56	113	
0000000536	3/28/99	19:57	113	
0000000537	3/28/99	19:58	113	
0000000538	3/28/99	19:59	113	
0000000539	3/28/99	20:00	113	
0000000540	3/28/99	20:01	113	
0000000541	3/28/99	20:02	113	
0000000542	3/28/99	20:03	35.3	Disconnected for Calibration Check
0000000543	3/28/99	20:04	51.5	Disconnected for Calibration Check
0000000544	3/28/99	20:05	109	Disconnected for Calibration Check
0000000545	3/28/99	20:06	113	
0000000546	3/28/99	20:07	113	
0000000547	3/28/99	20:08	113	
0000000548	3/28/99	20:09	112	
0000000549	3/28/99	20:10	113	
0000000550	3/28/99	20:11	112	
0000000551	3/28/99	20:12	113	
0000000552	3/28/99	20:13	113	
0000000553	3/28/99	20:14	113	
0000000554	3/28/99	20:15	113	
0000000555	3/28/99	20:16	113	
0000000556	3/28/99	20:17	114	
0000000557	3/28/99	20:18	114	
0000000558	3/28/99	20:19	114	
0000000559	3/28/99	20:20	114	
0000000560	3/28/99	20:21	114	
0000000561	3/28/99	20:22	114	
0000000562	3/28/99	20:23	114	
0000000563	3/28/99	20:24	114	
0000000564	3/28/99	20:25	114	
0000000565	3/28/99	20:26	114	
0000000566	3/28/99	20:27	115	
0000000567	3/28/99	20:28	115	
0000000568	3/28/99	20:29	116	
0000000569	3/28/99	20:30	116	
0000000570	3/28/99	20:31	116	
0000000571	3/28/99	20:32	116	
0000000572	3/28/99	20:33	116	
0000000573	3/28/99	20:34	116	
0000000574	3/28/99	20:35	116	
0000000575	3/28/99	20:36	116	
0000000576	3/28/99	20:37	117	
0000000577	3/28/99	20:38	117	
0000000578	3/28/99	20:39	117	
0000000579	3/28/99	20:40	117	
0000000580	3/28/99	20:41	117	

Background Su btractio n value (P PM): Off

0000000581	3/28/99	20:43	116
0000000582	3/28/99	20:44	117
0000000583	3/28/99	20:45	116
0000000584	3/28/99	20:46	116
0000000585	3/28/99	20:47	116
0000000586	3/28/99	20:48	116

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DATAPOINT	DATE	TIME	FID READING PPM ORGANICS	
0000000587	3/28/99	20:49	117	
0000000588	3/28/99	20:50	117	
0000000589	3/28/99	20:51	117	
0000000590	3/28/99	20:52	117	
0000000591	3/28/99	20:53	117	
0000000592	3/28/99	20:54	117	
0000000593	3/28/99	20:55	116	
0000000594	3/28/99	20:56	116	
0000000595	3/28/99	20:57	116	
0000000596	3/28/99	20:58	115	
0000000597	3/28/99	20:59	115	
0000000598	3/28/99	21:00	115	
0000000599	3/28/99	21:01	115	
0000000600	3/28/99	21:02	35.7	Disconnected for Calibration Check
0000000601	3/28/99	21:03	30.2	Disconnected for Calibration Check
0000000602	3/28/99	21:04	29.5	Disconnected for Calibration Check
0000000603	3/28/99	21:05	116	
0000000604	3/28/99	21:06	117	
0000000605	3/28/99	21:07	117	
0000000606	3/28/99	21:08	116	
0000000607	3/28/99	21:09	116	
0000000608	3/28/99	21:10	115	
0000000609	3/28/99	21:11	115	
0000000610	3/28/99	21:12	115	
0000000611	3/28/99	21:13	114	
0000000612	3/28/99	21:14	115	
0000000613	3/28/99	21:15	116	
0000000614	3/28/99	21:16	116	
0000000615	3/28/99	21:17	116	
0000000616	3/28/99	21:18	115	
0000000617	3/28/99	21:19	116	
0000000618	3/28/99	21:20	114	
0000000619	3/28/99	21:21	114	
0000000620	3/28/99	21:24	114	
0000000621	3/28/99	21:25	114	
0000000622	3/28/99	21:26	113	
0000000623	3/28/99	21:27	113	
0000000624	3/28/99	21:28	114	
0000000625	3/28/99	21:29	114	
0000000626	3/28/99	21:30	114	
0000000627	3/28/99	21:31	113	
0000000628	3/28/99	21:32	114	
0000000629	3/28/99	21:33	113	
0000000630	3/28/99	21:35	113	
0000000631	3/28/99	21:36	113	
0000000632	3/28/99	21:37	113	
0000000633	3/28/99	21:38	115	
0000000634	3/28/99	21:39	114	
0000000635	3/28/99	21:40	114	
0000000636	3/28/99	21:41	10.7	Disconnected from Stack
0000000637	3/28/99	21:42	6.3	Disconnected from Stack
0000000638	3/28/99	21:43	5.8	Disconnected from Stack
0000000639	3/28/99	21:44	5.5	Disconnected from Stack
0000000640	3/28/99	21:45	5.5	Disconnected from Stack
0000000641	3/28/99	21:46	5.5	Disconnected from Stack

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C106 SLUICING TEST 3

DATAPOINT	DATE	TIME	FID READING PPM ORGANICS	
0000000642	3/28/99	21:47	5.4	Disconnected from Stack
0000000643	3/28/99	21:48	5.9	Disconnected from Stack

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