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AFOEHL REPORT 90-143EQ00194HEF

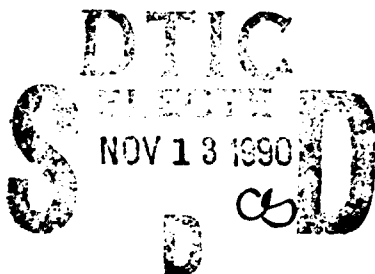
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**Source Emissions Testing of the
Air Stripping Process
Vance AFB OK**

ROBERT D. BINOVI, Lt Col, USAF BSC
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AUGUST 1990

Final Report

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**AF Occupational and Environmental Health Laboratory (AFSC)
Human Systems Division
Brooks Air Force Base, Texas 78235-5501**

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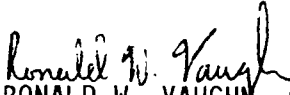
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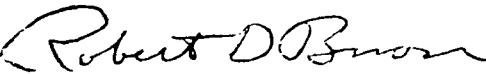
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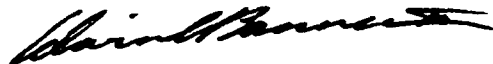
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REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing existing materials, gathering existing materials, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Service, Project Management, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE August 1990	3. REPORT TYPE AND DATES COVERED Final 21-25 May 90		
4. TITLE AND SUBTITLE Source Emissions Testing of the Air Stripping Process, Vance AFB OK		5. FUNDING NUMBERS		
6. AUTHOR(S) Robert D. Binovi, Lt Col, USAF, BSC Ronald W. Vaughn, Capt, USAF, BSC				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) AF Occupational and Environmental Health Laboratory Brooks AFB TX 78235-5501		8. PERFORMING ORGANIZATION REPORT NUMBER AFOEHL Report 90-143EQ00194HEF		
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) Same as Blk 7		10. SPONSORING / MONITORING AGENCY REPORT NUMBER		
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Statement A. Unlimited, approved for public release			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) At the request of HQ ATC/DEEV through HQ ATC/SGPB, source emissions testing for methylene chloride emissions in the air stripping tower vent and tower influent and effluent was performed at the pretreatment facility at Vance AFB on 21-25 May 90. Testing was conducted to provide data for the air quality permit to operate the pretreatment facility's air stripping tower as required by the Oklahoma State Department of Health. Results show the plant has operational problems, based on the percent removal calculations from the wastewater stream. The pretreatment plant is also not meeting the Federal pretreatment standard limits for methylene chloride from a new facility treating metal finishing waste (40 CFR 433.17). Recommendations included: (1) optimizing the plant operations by determining proper coagulant dosage and cleaning the stripping tower; (2) contacting the manufacturer to determine the design efficiency of the stripping tower; if not efficient enough, additional treatment such as carbon absorption needs to be added; and (3) completing another round of emissions testing after the plant's operation has been optimized.				
14. SUBJECT TERMS Source Emission Testing Stack Sampling Vaughn Binovi Pretreatment Plant Methylene Chloride Vance Air Stripping Process Chemical Oxygen Demand			15. NUMBER OF PAGES 37	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT SAR	

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I. INTRODUCTION

On 21-25 May 90, source emissions testing for methylene chloride emissions in the air stripping tower vent and tower influent and effluent was performed at the pretreatment facility at Vance AFB by personnel of the Environmental Quality Division of the Air Force Occupational and Environmental Health Laboratory (AFOEHL). Chemical oxygen demand (COD) concentrations in the tower influent and effluent were determined as well. This survey was performed at the request of HQ ATC DEEV through HQ ATC/SGPB to provide data for the air quality permit to operate the facility's air stripping tower. Personnel involved with on-site testing are listed in Appendix A.

II. DISCUSSION

A. Background

HQ ATC/DEEV through HQ ATC/SGPB requested this survey to provide data for the air quality permit to operate the pretreatment facility's air stripping tower (Appendix B). The Oklahoma State Department of Health required the following testing in the permit to construct:

1. Methylene chloride emission rate in the air stripper vent.
2. Methylene chloride concentration in the air stripper influent and effluent by gas chromatography.
3. COD concentration in the air stripper influent and effluent by Hach test kit. A correlation between COD and methylene chloride concentrations in the influent and effluent would also be established.

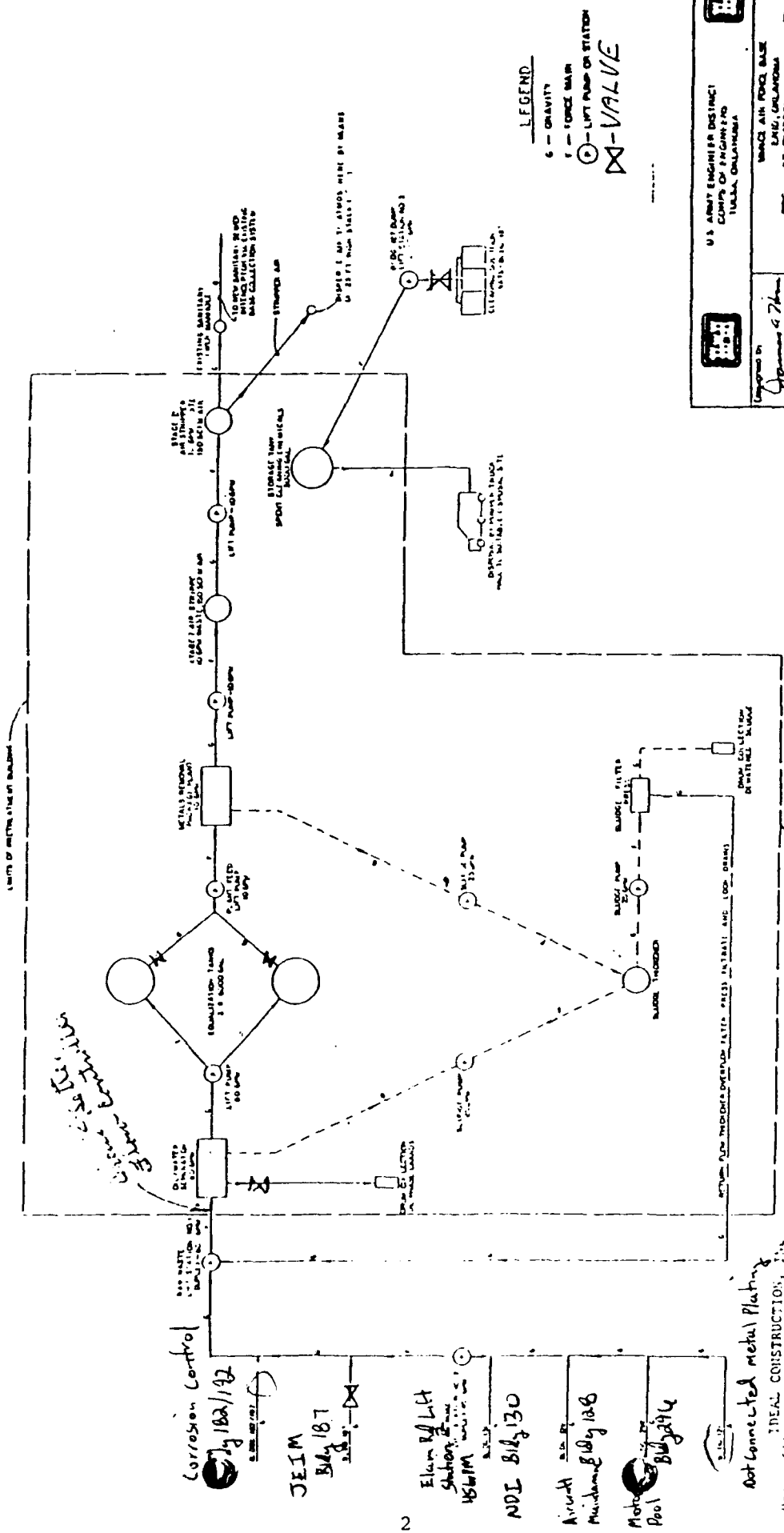
B. Site Description

The pretreatment facility, building 193, is located on the Vance AFB flight line. The facility treats waste from the corrosion control, jet engine intermediate maintenance, nondestructive inspection, aircraft maintenance, and base motor pool shops. A schematic of the facility is shown in Figure 1. Methylene chloride is stripped in two air strippers in series and then vented through the roof to the atmosphere. The air stripper was manufactured by Fiberglass Structures and has NOR-PAC packing. The unit does not have any air pollution control equipment.

The pretreatment facility is operated five days per week and approximately six hours per day. The flow rate in the facility averaged 6.3 gallons per minute. The facility discharges into an existing sanitary sewer manhole. The base's sanitary waste is treated off-base by the City of Enid.

C. Applicable Standards

Standards applicable to this pretreatment facility are defined under the Oklahoma State Department of Health construction permit 88-054-C and 40 CFR 433. These regulations, detailed in Appendix C, address two areas.



U.S. ARMY ENGINEER DISTRICT
COMPS OF ENGINEERS
TULSA, OKLAHOMA

Project: VANCE AIR FORCE BASE
Location: TULSA, OKLAHOMA
Design: REGIONAL WASTE WATER CONNECTION
Phase: PHASE I
Process Flow Diagram
Industrial Waste System

Drawn by: J. H. HARRIS
Checked by: J. H. HARRIS
Date: JUNE, 1968
Scale: 1" = 40' 0"

Figure 1. Process Flow Diagram

a. Construction permit 88-054-C: prohibits the emission of methylene chloride from the air stripper to the atmosphere in excess of 3.75 pounds per hour. A correlation of methylene chloride versus COD concentrations in the influent and effluent shall be established. In order for this correlation to be acceptable as a surrogate for methylene chloride analysis, a correlation coefficient approaching 1.0 must be obtained.

b. 40 CFR 433: prohibits the emission of total toxic organics into a publicly owned treatment works in excess of 2.13 milligrams per liter. Methylene chloride is included in the list of toxic organics.

D. Sampling Methods and Procedures

1. Air Emissions

Present regulations require that all emissions testing be conducted in accordance with Appendix A to Title 40, Code of Federal Regulations, Part 60 (40 CFR 60). Therefore, sample train preparation, sampling and recovery, calculations and quality assurance were done in accordance with methods and procedures outlined in 40 CFR 60, Appendix A, Method 18 and NIOSH Method 8329.

One sampling port was installed at a right angle to the air stripper vent. This port was installed approximately 8 duct diameters downstream and 2 duct diameters upstream from any flow disturbance. Sampling was conducted at the center of the vent.

Methylene chloride samples were collected using the sampling train shown in Figure 2. The train consisted of a metal probe, two charcoal tubes connected in series, and a pumping device. Vent gas velocity pressure was measured at the end of the probe using a Type S pitot tube connected to a 10-inch inclined-vertical manometer. A thermometer was used to measure vent gas and sampling train temperatures. The pumping device was calibrated before and after sampling.

All calculations were made using the Environmental Protection Agency publication entitled "Source Test Calculations and Check Programs for Hewlett-Packard Calculators", (EPA-340/1-85-013) and associated software programs. Methylene chloride samples were analyzed by gas chromatography.

2. Wastewater Sampling

Hourly grab samples for Chemical Oxygen Demand (COD) and Volatile Halocarbon Screen (EPA Method 601) were taken from the air stripping tower influent and effluent. Influent samples were taken from the metal removal process clarifier effluent (Figure 3). Effluent samples were taken from the plant discharge into a manhole outside the facility (Figure 4).

COD analyses were performed on site; the Hach Company closed reflux, colorimetric method was used to determine the COD concentration in each sample. The volatile samples were analyzed for methylene chloride and other volatile organic compounds by AFOEHL Analytical Services Division using EPA Method 601.

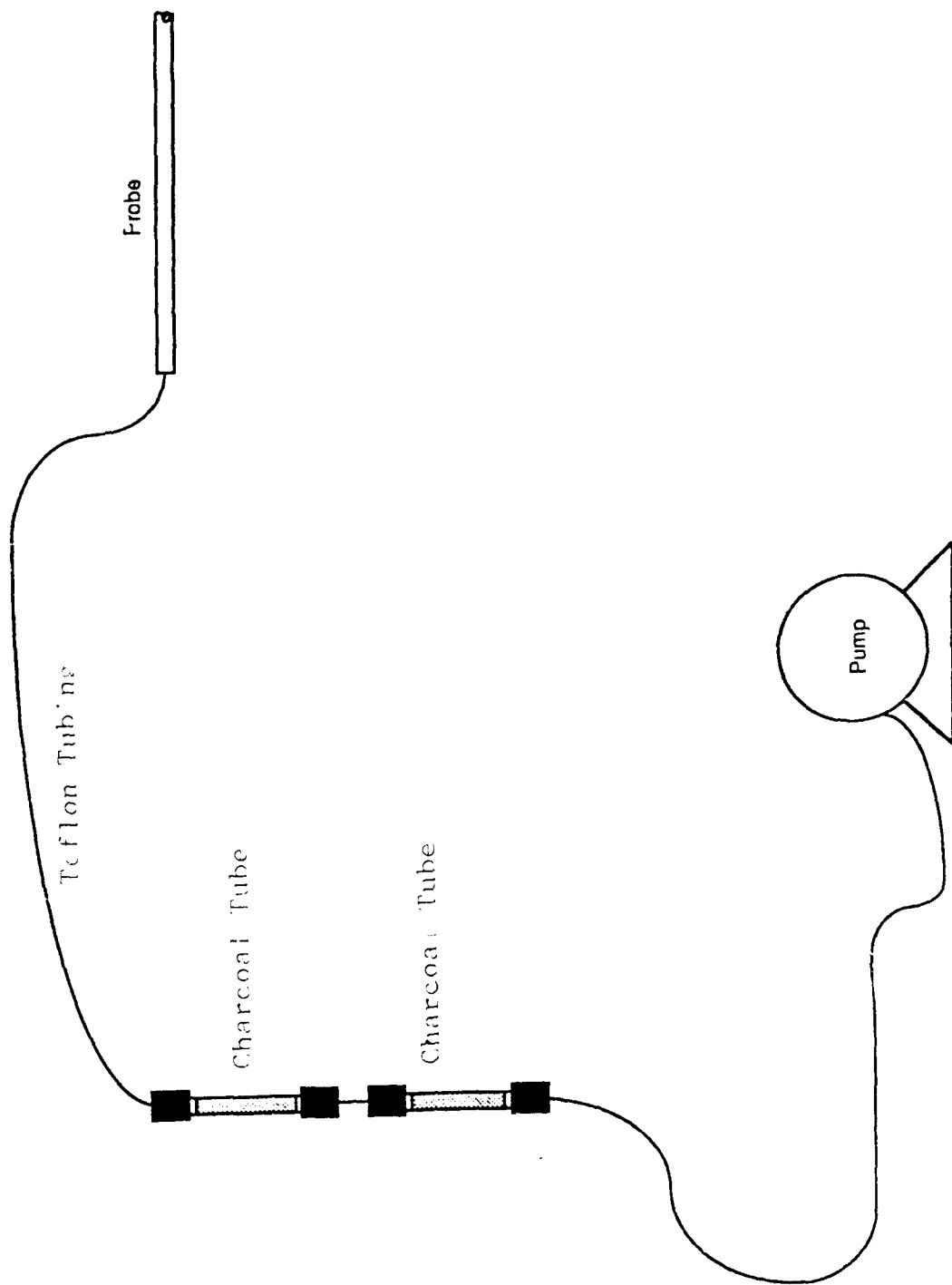


Figure 2. Methylene Chloride Air Sampling Train

E. Results

1. Air Emissions

During run 1, a velocity pressure of 0.53 inches of water was detected in the air stripper vent. However, this value was unable to be duplicated. Therefore, a value of 0.12 inches of water (duplicated during the run) was used to calculate the vent gas velocity. Equipment calibration sheets are found in Appendix D and the resulting methylene chloride calculations are presented in Appendix E. Table 1 provides the final methylene chloride emission test results. Methylene chloride emissions averaged 2.37 lb/hr. This is below limit of 3.75 lb/hr established in the permit to construct.

Table 1. Methylene Chloride Air Emissions Test Results

Run	TOTAL MECL COLLECTED (mg)	SAMPLE VOLUME (dscf)	VENT GAS FLOW RATE (dscfm)	EMISSIONS (lb/hr)
1	64.8	1.0927	114.47	0.8979
2	149.5780	0.7665	114.47	2.9548
3	148.3700	0.7665	127.42	<u>3.2625</u>
AVG =				2.3717

Note: mg = milligrams
dscf = dry standard cubic foot
dscfm = dry standard cubic foot per minute
lb/hr = pounds per hour

2. Wastewater Results:

a. Flow Measurement

The flow rate in the pretreatment facility was calculated by measuring the plant effluent, timing a known volume of effluent. The flow rate averaged 6.3 gallons per minute (23.8 L/min).

b. Analytical Results

(1) Table 2 provides COD and methylene chloride analysis results for the metal removal package clarifier effluent and facility effluent. The COD results averaged in the metal removal package effluent 5180 mg/L and 4420 mg/L in the pretreatment facility effluent. The methylene chloride results averaged 517.3 mg/L (1.64#/hr in the clarifier and 244.6 mg/L (0.77#/hr) in the pretreatment facility effluent.

Table 2. COD and Methylene Chloride Wastewater Results

TIME SAMPLE TAKEN	COD (mg/L)	MECL (mg/L)	LOCATION	EMISSIONS (#/hr)	% REMOVAL
0953	3000	482.9	CLARIFIER	1.16	75.6
1000	2800	117.7	EFFLUENT		
1045	5000	488.9	CLARIFIER	0.68	43.8
1052	4200	274.8	EFFLUENT		
1145	5900	716.9	CLARIFIER	1.24	54.7
1152	4900	324.4	EFFLUENT		
1245	550	388.9	CLARIFIER	0.30	16.6
1250	600	294.2	EFFLUENT		
1400	6500	508.9	CLARIFIER	0.94	58.1
1400	4200	212.9	EFFLUENT		
AVG.	5180	517.3	CLARIFIER	0.863	52.7
AVG.	4420	244.6	EFFLUENT		

note: mg/L = milligrams per liter
#/hr = pounds per hour

(2) The simple linear regression of the COD and the methylene chloride concentrations as performed by a pocket calculator (Texas Instruments, TI-60) resulted in a correlation coefficient (coefficient of determination, r^2) of 0.52 (0.84 if only effluent concentrations, or 0.27 if only clarifier concentrations were considered).

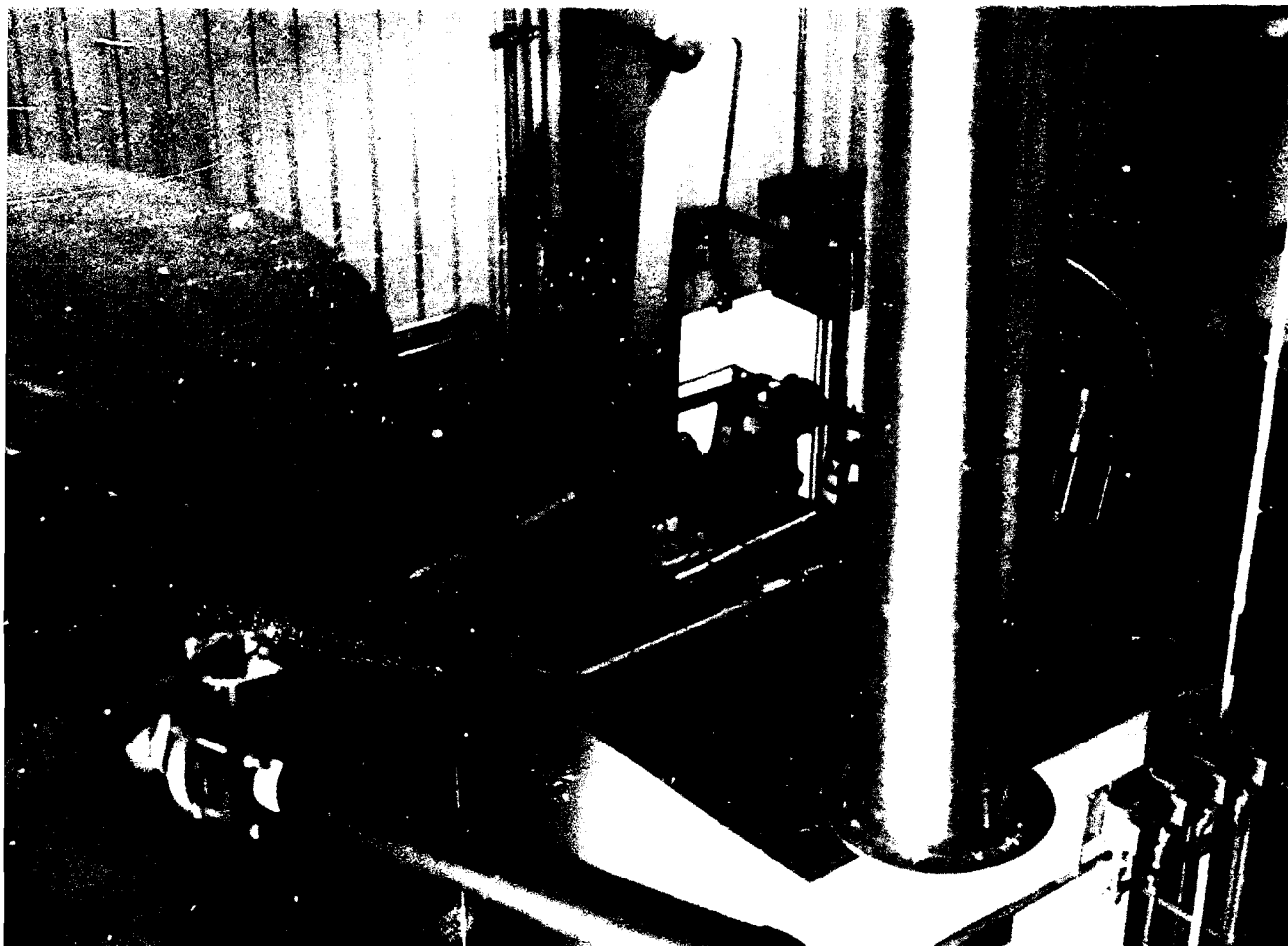


Figure 3. Clarifier Effluent



Figure 4. Sanitary Sewer Manhole

III. CONCLUSIONS

A. The plant has operational problems, based on the percent removal calculations from the wastewater stream. Both the results of the wastewater and source emission testing showed methylene chloride emissions were below the permitted rate of 3.75 #/hour. However, this is during operations when the stripping tower is operating at half efficiency. If the stripping tower was operating at 99% efficiency, 3.75 #/hr limit would relate to an average clarifier concentration of 1196 mg/L of methylene chloride. This problem appears to be linked to excessive polymer use and the interference of the polymer to free flow in the stripping tower, providing flooding condition. Flooding in a tower reduces the effective area for liquid to gas diffusion.

B. The wastewater and air emissions results correlated adequately, the apparent differences in emissions rates can be related to differences in sampling techniques and the non-homogeneity of the material to be stripped. The wastewater samples were grab samples, representing only snapshots in time while the air samples captured mass over the run, then the mass was converted to a rate by velocity measurements, given a known diameter. Even the air samples are snapshots since velocities were variable, and do not represent truly continuous monitoring over the entire run. Based on a 52.7% efficiency, the air measurements related to an average influent concentration of methylene chloride to the stripping tower of 1420 mg/L.

C. The addition of excessive polymer resulting in high COD concentrations makes any attempt to correlate effluent methylene chloride concentrations to COD questionable, based on the results of linear regression of this data. Correlation of effluent data to COD was strong (0.84), however, not in the range of absolute (1.0) referred to in the operating permit.

D. The pretreatment plant is not meeting the Federal Pretreatment Standard limits for methylene chloride from a new facility treating metal finishing wastes (40 CFR 433.17) of 2.13 mg/L for total toxic organics (TTO), a list in which methylene chloride is included. If the column is operating at 99% removal efficiency, then the influent concentration will be limited to 213 mg/L. Clearly, the column must operate between 99-99.9% efficiency to effectively treat to FPS limits, without further treatment such as carbon absorption, given the known influent concentrations of methylene chloride. A carbon absorption column appears to be needed.

IV. RECOMMENDATIONS

A. Plant operation needs to be optimized. The optimum type and concentration of polymer needs to be determined. In order to facilitate the optimization, the column needs to be cleaned of residual polymer.

B. The manufacturer of the air stripping column needs to be contacted to determine if the column will achieve the needed efficiency for methylene chloride needed to meet FPS. If not, a carbon absorption column may be necessary.

C. Another round of emissions testing is recommended after the plant's operation has been optimized.

REFERENCES

1. Standards of Performance for New Stationary Sources, Title 40, Part 60, Code of Federal Regulations, July 1, 1988.
2. Quality Assurance Handbook for Air Pollution Measurement Systems - Volume III, Stationary Source Specific Methods, U.S. Environmental Protection Agency, EPA-600/4-77-027-b, Research Triangle Park, North Carolina, April 1977.
3. Source Test Calculations and Check Programs for Hewlett-Packard 41 Calculators, U.S. Environmental Protection Agency, EPA-340/1-85-018, Research Triangle Park, North Carolina, September 1985.
4. Federal Pretreatment Standard for Metal Finishing Point Source Category, Title 40, Part 433, Code of Federal Regulations, July 1, 1989.
5. USEPA, Methods for Chemical Analysis of Water and Wastewater, EPA-600/45-79-020, March 1983.

APPENDIX A
Personnel Information

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1. AFOEHL TEST TEAM

Lt Col Robert D. Binovi, Chief Engineer
Capt Paul T. Scott, Chief, Air Quality Function
Capt Ronald W. Vaughn, Consultant, Environmental Quality
Sgt Robert P. Davis, Technician, Environmental Quality

AFOEHL/EQ
Brooks AFB TX 78235-5501

Phone: AUTOVON 240-3305
Commercial (512) 536-3305

2. Vance AFB on-site representatives

Col David Lloyd	Base Commander
Mr. Bob Taylor	Base Civil Engineer
Mr. Bob Holden	Plant Operator
Mr. Max Cumpston	Base Environmental Coordinator
	AV 962-6208
	COM (405) 249-6208
TSgt Steven B. Lamoreaux	USAF Clinic/SGPB
Sgt Tony A. Quintana	USAF Clinic/SGPB
	AV 962-7241
	COM (405) 249-7241

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APPENDIX B
Letter of Request

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR TRAINING COMMAND (ATC)
RANDOLPH AIR FORCE BASE TX 78150-5001

5: 11 MAY 90
LC Binovi EQ

TO
SGPB (7-3764)

23 APR 1990

RE: Request for On-Site Consultant Services - Vance AFB

TO USAF OEHL/CC

1. In accordance with the provisions of AFR 161-17, the attached request for consultant services is forwarded for your consideration. The HQ ATC Environmental Planning Division is asking for an on-site survey of the hazardous waste pretreatment system. They will provide the necessary funds for the services rendered.
2. This request has been coordinated with Lt Col Binovi and most of the technical issues have been discussed. The requested survey is somewhat time-sensitive since Vance must have, within the next 90 days, sampling data to support a needed air emissions permit.
3. Please feel free to contact either the POCs identified in the attached request or Maj Killan of my office.

DAVID A. HADDEN, Colonel, USAF, BSC
Command Bioenvironmental Engineer
DCS/Medical Services & Training

1 Atch
HQ ATC/DEEV Ltr, 21 Apr 90

cc: HQ ATC/DEEV wo atch

EQ - Action



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR TRAINING COMMAND (ATC)
RANDOLPH AIR FORCE BASE TX 78150-5001

21 APR 1990

REF ID: A11111 DEEV

SUBJECT Combined Air and Wastewater Sampling Support - Vance AFB

TO: SGPB

1. We recently discussed the need for OEHL to do sampling at Vance and provide data for purposes of obtaining an operating permit for the Vance pretreatment system. Please ask the OEHL to perform the combined air and wastewater sampling requirements as discussed among Lt Col Binovi of OEHL, your office and me.

2. Our POC is Capt David Parker, 73240. The POC at Vance is Mr Max Cumpston, AUTOVON 962-6208.


JOSE L. SAENZ, Lt Col, USAF
Chief, Envmtl Planning Div
Directorate of Engrg, Const, and
Envmtl Planning
DCS/Engineering and Services

APPENDIX C
Governing Regulations

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Joan K. Leavitt, M.D.
Commissioner

OKLAHOMA STATE
DEPARTMENT OF HEALTH



Board of Health
Linda M. Johnson, MD
President
Ernest D. Martin, PhD
Vice-President
Walter Scott Mason, III
Secretary-Treasurer

Wallace Byrd, MD
John B. Cammerman, DDS
Dan H. Fieger, DO
Burdge F. Green, MD
James L. Henry

P.O. BOX 53551
1000 N.E. TENTH
OKLAHOMA CITY, OK 73152

AN EQUAL OPPORTUNITY EMPLOYER

August 17, 1988

Mr. Gary D. Lynn
Deputy Regional Civil Engineer
Air Force Regional Civil Engineer - Central Region
1114 Commerce Street, Suite 206
Dallas, Texas 75242-0216

Re: Construction Permit 88-054-C
Vance Air Force Base, Oklahoma
Methylene Chloride Stripper/Vent
Garfield County, Oklahoma

Dear Mr. Lynn:

Enclosed is the permit authorizing construction of the referenced facility. Please note that this permit is issued subject to certain standard and specific conditions which are attached.

Thank you for your cooperation in this matter. If we may be of further service, please contact our office.

Very truly yours,

Don M. Morris
Don M. Morris, Engineer
Permits & Enforcement Division
AIR QUALITY SERVICE

DMM/cw
Enclsr.

cc Mr. James A. Horn
Environmental Engineer
U.S. Army Corps of Engineers
P.O. Box 61
Tulsa, OK 74121
cc Nancy Coleman
AIR QUALITY SERVICE

PERMIT TO CONSTRUCT
AIR POLLUTION CONTROL FACILITY
(continued)

Specific ConditionsPermit No. 88-054-C

1. Points of emission and pollutant mass emission rate limitation:

<u>ID</u>	<u>Emission Source</u>	<u>Methylene Chloride (CH₂Cl₂) lb/hr</u>
V-1	Atmospheric Vent from Methylene Chloride Stripper Column	3.75 ?

2. Upon commencement of operations, the permittee shall initiate the following steps as a means of monitoring operations:

- a) Initially, a series of waste water samples shall be analyzed for both (i) the COD demand as indicated by Hach (or equivalent) test kit results and (ii) methylene chloride concentration by laboratory gas chromatograph procedure. A correlation of methylene chloride vs. COD analysis shall be established and a daily COD test procedure implemented on site for methylene chloride analysis.
- b) The following system parameters shall be observed each operating day and a log of results maintained on site:
 - i) Flow rate of waste liquid to stripper (recording flowmeter).
 - ii) Flow rate of air to stripper (measured or referenced to fan operating curve).
 - iii) Methylene chloride concentration in both rich and denuded waste liquid (COD/GC test).
 - iv) Rate (lb/hr) of methylene chloride emitted from stripper (by material balance calculations).

Additionally, at least once weekly the permittee shall:

- v) Analyze both the rich and denuded waste liquid for methylene chloride by gas chromatograph and maintain these results in the operations log. These samples should be duplicates of corresponding (daily) COD samples.

Any test result that indicates an emission rate of methylene chloride in excess of that specified in Condition 1 shall be cause for system shutdown and an excess emission episode report to Air Quality Service as soon as practicable during normal office hours.

SPECIFIC CONDITIONS -
Vance Air Force Base, Oklahoma
88-054-C

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3. Within 60 days following commencement of operations, the permittee shall submit an application for an operating permit. The test data and correlation developed for methylene chloride analysis should be submitted as a part of the application.
4. Upon issuance of an operating permit, the permittee shall be authorized to operate the facility 24 hours per day, 365 days per year.
5. In order to retain the exemption for the industrial pretreatment unit from hazardous waste regulations, verification that the industrial waste stream is admixed with domestic wastewater prior to entering the industrial waste pretreatment facility must be submitted as a part of the application for the operating permit.

PERMIT TO CONSTRUCT
AIR POLLUTION CONTROL FACILITY
(continued)

Standard Conditions

1. This permit is void 18 months after date of issue unless construction on this project has started on or prior to that date, or if the work involved in the construction is suspended for 18 months or more after it has commenced.
2. The recipient of this permit shall apply for a permit to operate within 60 days following the first day of operation.
3. If any statement or representation in the application is found to be incorrect, this permit may be revoked and the permittee thereupon waives all rights thereunder; however, the application may be amended and a supplemental written permit issued therefor.
4. There shall be no deviation from the approved plans and specifications unless additional or revised plans are submitted to the Air Quality Service and approved.
5. During or after the construction or the installation of the equipment for which this permit was issued, any agent of the State Department of Health shall have the right and authority to inspect such work and operation.
6. If source emission testing of stacks or process vents is determined necessary, the holder of this permit is responsible for providing sampling facilities and conducting the sampling test at his own expense.
7. When applicable, any records necessary to ascertain continued compliance shall be maintained by the permit holder and made available at the request of personnel from Air Quality Service.
8. That the Air Quality Service of the Oklahoma State Department of Health shall be kept informed on occurrences which may affect the eventual performance of the facility or that will unduly delay the progress of the project.
9. The permit incorporates by reference all statements or representatives of limitations addressed by the applicant in the application and supplemental supporting data and further incorporates any and all limitations calculated or established in the Air Quality Analysis resulting in the issuance of this permit.
10. This permit incorporates by reference all approved air quality control regulations in effect at the issuance of this permit including affirmative actions herein or hereafter required by the Commissioner and all emission limits established in the several control regulations subject only to more stringent limits specifically or generally contained in this permit.

Environmental Protection Agency

§ 433.17

1984, however metal finishing facilities which are also covered by Part 420 (iron and steel) need not comply before July 10, 1985. Compliance with the provisions of paragraphs (a) and (b) of this section shall be achieved as soon as possible, but not later than February 15, 1986.

[48 FR 32485, July 15, 1983, as amended at 48 FR 41410, Sept. 15, 1983; 48 FR 43682, Sept. 26, 1983]

§ 433.16 New source performance standards (NSPS).

(a) Any new source subject to this subpart must achieve the following performance standards:

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
Milligrams per liter (mg/l)		
Cadmium (T)	0.11	0.07
Chromium (T)	2.77	1.71
Copper (T)	3.38	2.07
Lead (T)	0.69	0.43
Nickel (T)	3.98	2.38
Silver (T)	0.43	0.24
Zinc (T)	2.61	1.48
Cyanide (T)	1.20	0.65
Oil and Grease	52	26
TSS	60	31
pH	(1)	(1)

(1) With a 6.0 to 9.0

(b) Alternatively, for industrial facilities with cyanide treatment, and upon agreement between a source subject to these limits and the pollution control authority, the following amenable cyanide limit may apply in place of the total cyanide limit specified in paragraph (a) of this section:

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
Milligrams per liter (mg/l)		
Cyanide (A)	0.86	0.32

(c) No user subject to the provisions of this subpart shall augment the use of process wastewater or otherwise

dilute the wastewater as a partial or total substitute for adequate treatment to achieve compliance with this limitation.

[48 FR 32485, July 15, 1983; 48 FR 43682, Sept. 26, 1983]

§ 433.17 Pretreatment standards for new sources (PSNS).

(a) Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources (PSNS):

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
Milligrams per liter (mg/l)		
Cadmium (T)	0.11	0.07
Chromium (T)	2.77	1.71
Copper (T)	3.38	2.07
Lead (T)	0.69	0.43
Nickel (T)	3.98	2.38
Silver (T)	0.43	0.24
Zinc (T)	2.61	1.48
Cyanide (T)	1.20	0.65
TTO	2.13	

(b) Alternatively, for industrial facilities with cyanide treatment, and upon agreement between a source subject to these limits and the pollution control authority, the following amenable cyanide limit may apply in place of the total cyanide limit specified in paragraph (a) of this section:

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
Milligrams per liter (mg/l)		
Cyanide (A)	0.86	0.32

(c) No user subject to the provisions of this subpart shall augment the use of process wastewater or otherwise dilute the wastewater as a partial or total substitute for adequate treat-

Part 434

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ment to achieve compliance with this limitation.

(d) An existing source submitting a certification in lieu of monitoring pursuant to § 433.12 (a) and (b) of this regulation must implement the toxic organic management plan approved by the control authority.

[48 FR 32485, July 15, 1983; 48 FR 43682, Sept. 26, 1983]

PART 434—COAL MINING POINT SOURCE CATEGORY BPT, BAT, BCT LIMITATIONS AND NEW SOURCE PERFORMANCE STANDARDS

Subpart A—General Provisions

Sec.

434.10 Applicability.

434.11 General definitions.

Subpart B—Coal Preparation Plants and Coal Preparation Plant Associated Areas

434.20 Applicability.

434.21 [Reserved]

434.22 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

434.23 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

434.24 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

434.25 New source performance standard (NSPS).

Subpart C—Acid or Ferruginous Mine Drainage

434.30 Applicability; description of the acid or ferruginous mine drainage subcategory.

434.31 [Reserved]

434.32 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

434.33 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Sec.

434.34 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

434.35 New source performance standards (NSPS).

Subpart D—Alkaline Mine Drainage

434.40 Applicability; description of the alkaline mine drainage subcategory

434.41 [Reserved]

434.42 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

434.43 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

434.44 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

434.45 New source performance standards (NSPS).

Subpart E—Post-Mining Areas

434.50 Applicability.

434.51 [Reserved]

434.52 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

434.53 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

434.54 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

434.55 New source performance standards (NSPS).

Subpart F—Miscellaneous Provisions

434.60 Applicability.

434.61 Commingling of waste streams.

434.62 Alternate effluent limitations for pH.

434.63 Effluent limitations for precipitation events.

434.64 Procedure and method detection limit for measurement of settleable solids.

434.65 Modifications of NPDES Permits for New Sources.

APPENDIX D
Calibration Data

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INDUSTRIAL HYGIENE SAMPLING DATA

OEHL USE ONLY

(Use this space for mechanical imprint.)

WORKPLACE
IDENTIFIER

BASE

ORGANIZATION

W Vance AFB

CE

Pre-treatment Facility

DATE COLLECTED (Y/M/DD)

4 10 0 15 2 4

BLDG NO./LOCATION

Bldg 193

ROOM/AREA

MAIL
REPORTS
TO
(circle if
changed)

ORIGINAL

COPY 1

COPY 2

AFDEHLEUE Bldg 195W Capt Vaughn

SAMPLE COLLECTED BY (Name, grade, AFSC)

Ronald W. Vaughn Capt

SIGNATURE

Ronald W. Vaughn

AUTOXON Local

2891

OEHL PID

REASON FOR
SUBMISSION

H

A-ACCIDENT/INCIDENT C-COMPLAINT F-FOLLOWUP/CLEANUP
R-ROUTINE/PERIODIC SURVEY O-OTHER (Specify)

SOURCE BEING SAMPLED

Air Strippers / Permit Application

EXISTING CONTROLS (Personal Protective Equipment, Engineering, Administrative)

N/A

SAMPLE COLLECTION DATA

EMPLOYEE NAME & SSAN
OR
SAMPLE LOCATION

Vent

Vent

Vent

OEHL SAMPLE NO.

BASE SAMPLE NO.

COLLECTING MEDIA

PY900008

PY900008

PY900010

CTCT 101

CTCT 101

CTCT 101

ANALYSES
REQUESTEDA NAME
NIOASH NO.

Methylene Chloride

Methylene Chloride

Methylene Chloride

B NAME
NIOASH NO.

PA8050000

PA8050000

PA8050000

C NAME
NIOASH NO.D NAME
NIOASH NO.

PUMP OR MONITOR NO.

1791

1791

1791

COLLECTION TIME OFF/ON

1107 / 1020

1107 / 1020

1205 / 1118

TOTAL COLLECTION TIME

67 min

67 min

47 min

FLOW RATE: ON/OFF

0.5LPM / 0.5LPM

0.5LPM / 0.5LPM

0.5LPM / 0.5LPM

VOLUME SAMPLED

33.5 L

33.5 L

23.5 L

TEMPERATURE/BAROMETER

81°F / 28.320

81°F / 28.320

81°F / 28.320

RELATIVE HUMIDITY/WIND

SUPPORTING
SAMPLESOEHL
SAMPLE NO.BASE
SAMPLE NO.

NOMENCLATURE

COMMENTS

Priority

SUMMARY OF SURVEY RESULTS (See reverse for calculations)

CALCULATED EXPOSURE CONCENTRATIONS

STANDARDS

INDUSTRIAL HYGIENE SAMPLING DATA				OEHL USE ONLY				
(Use this space for mechanical imprint)				WORKPLACE IDENTIFIER BASE Vance AFB WORKPLACE P. H. Clement Fuel BLDG NO./LOCATION Bldg 193 ORGANIZATION CE				
DATE COLLECTED 9/10/01 5/2/14				ROOM/AREA				
MAIL REPORTS TO (circle if changed) ORIGINAL COPY 1 COPY 2				AFUEHL/ERE Bldg 175W Capt Vaughan				
SAMPLE COLLECTED BY (Name, grade, AFSC) Ronald W. Vaughan Capt				SIGNATURE Ronald W. Vaughan		AUTOVON 6010 2991 OEHL PID		
REASON FOR SUBMISSION ☒ H ☐ A ACCIDENT/INCIDENT C-COMPLAINT F-FOLLOWUP/CLEANUP ROUTINE/PERIODIC SURVEY O-OTHER (Specify)								
SOURCE BEING SAMPLED Air Stripper / Permit Application								
EXISTING CONTROLS (Personal Protective Equipment, Engineering, Administrative) N/A								
SAMPLE COLLECTION DATA								
EMPLOYEE NAME & SSAN OR SAMPLE LOCATION		Vent		Vent		Vent		
OEHL SAMPLE NO.								
BASE SAMPLE NO.		Py900011		Py900012		Py900013		
COLLECTING MEDIA		CTCT 101		CTCT 101		CTCT 101		
ANALYSES REQUESTED	A	NAME NIOSH NO. Methylene Chloride PA80500000		NAME NIOSH NO. Methylene Chloride PA80500000		NAME NIOSH NO. Methylene Chloride PA80500000		
	B							
	C							
	D							
PUMP OR MONITOR NO.		1791		1790		1790		
COLLECTION TIME OFF/ON		1205 / 1118		1300 / 1213		1300 / 1213		
TOTAL COLLECTION TIME		47 min		47 min		47 min		
FLOW RATE: ON/OFF		0.5 LPM / 0.5 LPM		0.5 LPM / 0.5 LPM		0.5 LPM / 0.5 LPM		
VOLUME SAMPLED		23.5L		23.5L		23.5L		
TEMPERATURE/BAROMETER		81°F / 28.320		81°F / 28.320		81°F / 28.320		
RELATIVE HUMIDITY/WIND								
SUPPORTING SAMPLES	OEHL SAMPLE NO.							
	BASE SAMPLE NO.							
	NOMENCLATURE							
COMMENTS Priority								
SUMMARY OF SURVEY RESULTS (See reverse for calculations)								
CALCULATED EXPOSURE CONCENTRATIONS				STANDARDS				

INDUSTRIAL HYGIENE SAMPLING DATA										OEHL USE ONLY									
(this space for mechanical imprint)										WORKPLACE IDENTIFIER BASE <u>Vance AFB</u> WORKPLACE <u>Pretreatment Facility</u> BLDG NO./LOCATION <u>Bldg 193</u> ROOM/AREA <u>Bldg 175 W Capt Vaughn</u>									
										ORGANIZATION									
DATE COLLECTED (YYMMDD) <u>10 05 24</u>										AUTOVON <u>2891</u> Local									
MAIL PORTS TO (circle if changed) ORIGINAL COPY 1 COPY 2										SIGNATURE <u>Donald W. Vaughn</u> OEHL PID <u>2891</u>									
SAMPLE COLLECTED BY (Name, grade, AFSC) <u>AFD/EHL/EDC</u>										REASON FOR SUBMISSION ☒ A-ACCIDENT/INCIDENT ☐ C-COMPLAINT ☐ F-FOLLOWUP/CLEANUP ☐ R-ROUTINE/PERIODIC SURVEY ☐ O-OTHER (Specify)									
PURPOSE BEING SAMPLED <u>As Stopped / Permit Application</u>																			
LISTING CONTROLS (Personal Protective Equipment, Engineering, Administrative) <u>N/A</u>																			
SAMPLE COLLECTION DATA																			
EMPLOYEE NAME & SSAN OR SAMPLE LOCATION					Vent					Vent									
OEHL SAMPLE NO.																			
BASE SAMPLE NO.					PY900014					PY900015									
COLLECTING MEDIA					CTCT 101					CTCT 101									
ANALYSES REQUESTED					A NAME NIOSH NO.					Methylene Chloride PA8050000					Methylene Chloride PA8050000				
					B NAME NIOSH NO.														
					C NAME NIOSH NO.														
					D NAME NIOSH NO.														
PUMP OR MONITOR NO.					1790					1790									
COLLECTION TIME: OFF/ON					1400 / 1313					1400 / 1313									
TOTAL COLLECTION TIME					47 min					47 min									
FLOW RATE: ON/OFF					0.5 LPM / 0.5 LPM					0.5 LPM / 0.5 LPM									
VOLUME SAMPLED					23.5 L					23.5 L									
TEMPERATURE/BAROMETER					81°F /					81°F / 28.320									
RELATIVE HUMIDITY/WIND																			
SUPPORTING SAMPLES					OEHL SAMPLE NO.														
					BASE SAMPLE NO.														
					NOMENCLATURE														
COMMENTS <u>Priority</u>																			
SUMMARY OF SURVEY RESULTS (See reverse for calculations)																			
CALCULATED EXPOSURE CONCENTRATIONS										STANDARDS									

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APPENDIX E

Methylene Chloride Emissions Calculations

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FROM *MA00FL0

RUN NUMBER
ONE RUN
VOL MTR STD 0
110.417 RUN
STACK DECFM 0
114.4700 RUN
FRONT 1/2 MG 0
84.0000 RUN
BACK 1/2 MG 0
0.0000 RUN

F GR/DSCF = 2.5178
F MG/MNN = 6.084,3138
F LB/HR = 3.5578
F KG/HR = 0.4077

FROM *MA00FL0

RUN NUMBER
TWO RUN
VOL MTR STD 0
110.417 RUN
STACK DECFM 0
114.4700 RUN
FRONT 1/2 MG 0
140.5700 RUN
BACK 1/2 MG 0
0.0000 RUN

F GR/DSCF = 3.0118
F MG/MNN = 6.851,3304
F LB/HR = 3.3548
F KG/HR = 0.7407

FROM *MA00FL0

RUN NUMBER
THREE RUN
VOL MTR STD 0
110.417 RUN
STACK DECFM 0
114.4700 RUN
FRONT 1/2 MG 0
140.5700 RUN
BACK 1/2 MG 0
0.0000 RUN

F GR/DSCF = 2.5972
F MG/MNN = 6.535,7594
F LB/HR = 3.3529
F KG/HR = 0.4799

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1

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1

Det 1, AFOEHL
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HUMAN SYSTEMS DIVISION (AFSC)

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