ILLINOIS POLLUTION CONTROL BOARD

BRANDIS AIRCRAFT,	)	
	)	
Petitioner,	)	
	)	
v.	)	**PCB 21-112**
	)	**(Permit Appeal - RCRA)**
ILLINOIS ENVIRONMENTAL	)	
PROTECTION AGENCY,	)	
	)	
Respondent.	)	

NOTICE OF FILING

To: See Attached Service List

PLEASE TAKE NOTICE that on July 12, 2021, I electronically filed with the Clerk of the Pollution Control Board of the State of Illinois this Notice of Filing, the Certificate of Record on Appeal, the Record and a Certificate of Service, copies of which are attached hereto and herewith served upon you.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY,

By KWAME RAOUL, Attorney General,
State of Illinois

MATTHEW J. DUNN, Chief
Environmental Enforcement/Asbestos
Litigation Division

BY: /ss/ Raymond J. Callery
RAYMOND J. CALLERY
ARDC # 6193579
Environmental Bureau
Assistant Attorney General

Office of the Attorney General
500 South Second Street
Springfield, Illinois 62706
(217) 782-9031
raymond.callery@illinois.gov
Dated: July 12, 2021

SERVICE LIST

Stephen F. Hedinger
Sorling Northrup
One North Old State Capitol Plaza
Suite 200
Springfield, IL 62701
sfhedinger@sorlinglaw.com

Carol Webb
Illinois Pollution Control Board
1021 North Grand Avenue East
P.O. Box 19274
Springfield IL 62794-9274
Carol.Webb@illinois.gov

ILLINOIS POLLUTION CONTROL BOARD

BRANDIS AIRCRAFT,	)	
	)	
Petitioner,	)	
	)	
v.	)	**PCB 21-112**
	)	**(Permit Appeal - RCRA)**
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
Respondent.	)	

CERTIFICATE OF RECORD ON APPEAL

Respondent, ILLINOIS ENVIRONMENTAL PROTECTION AGENCY ("Illinois EPA") in accordance with the procedural rules of the ILLINOIS POLLUTION CONTROL BOARD ("Illinois PCB") set forth in 35 Ill. Adm. Code 105.116 and l05.212, states the following constitutes an index of the documents comprising the record on appeal:

1. R1-10 -- 11/25/20 Request for Certification of Closure.
2. R11-12 -- 4/21/21 Denial of Certification of Closure.
3. R13-24 -- Permit Log.
4. R25-27 -- 12/17/96 Closure Letter.
5. R28-97 -- 8/29/03 Inspection Report.
6. R98-99 -- 9/25/03 FOS Letter.
7. R100-744 -- 5/14/14 Inspection Report with attachments.
8. R745-758 -- 9/14/14 Violation Notice.
9. R759-762 -- 12/10/14 Response to Violation Notice.
10. R763-764 -- 12/26/14 NIPLA.
11. R765-782 -- 2/27/18 Inspection Report.

12. R783-794 -- Emails related to permit review.

CERTIFICATION

WILLIAM T. SINNOTT, II, hereby certifies on information and belief that the entire record of the Respondent's decision, as defined in 35 Ill. Adm. Code 105.212(b), is hereby provided.

BY:__s/William T. Sinnott, II______________
William T. Sinnott, II
Environmental Protection Engineer
Permit Section, Bureau of Land
Illinois Environmental Protection Agency

Respectfully submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY,

By KWAME RAOUL, Attorney General,
State of Illinois

MATTHEW J. DUNN, Chief
Environmental Enforcement/Asbestos
Litigation Division

BY:_/ss/ Raymond J. Callery_______
RAYMOND J. CALLERY
ARDC # 6193579
Environmental Bureau
Assistant Attorney General

Office of the Attorney General
500 South Second Street
Springfield, Illinois 62706
(217) 782-9031
raymond.callery@illinois.gov

Dated: July 12, 2021

Brandis Aircraft v. Illinois Environmental Protection Agency
Pollution Control Board No. 21-112

CERTIFICATE OF SERVICE

I hereby certify that I did on July 12, 2021, caused to be served by e-mail true and correct copies of the documents entitled Notice of Filing, Certificate of Record on Appeal, and Record (R1-794) upon:

Stephen F. Hedinger
Sorling Northrup
One North Old State Capitol Plaza
Suite 200
Springfield, IL 62701
sfhedinger@sorlinglaw.com

Carol Webb
Illinois Pollution Control Board
1021 North Grand Avenue East
P.O. Box 19274
Springfield IL 62794-9274
Carol.Webb@illinois.gov

s/Theresa M. Flinn
Theresa M. Flinn
Administrative Secretary

Under penalties as provided by law pursuant to Section 1-109 of the Code of Civil Procedure, the undersigned certifies that the statements set forth in this certificate of service are true and correct, except as to matters therein stated to be on information and belief and as to such matters the undersigned certifies as aforesaid that she verily believes the same to be true.

s/Theresa M. Flinn
Theresa M. Flinn
Administrative Secretary

ANDREWS ENGINEERING
3300 Ginger Creek Drive | 217.787.2334
Springfield, IL 62711

R000001

~~C-556-M-10~~

cc: Springfield

C-900 WRW

November 25, 2020

Illinois Environmental Protection Agency
Bureau of Land
Mr. Kenneth Smith, P.E., Manager
Permit Section
1021 N Grand Ave East
Springfield, IL 62794-9276

RECEIVED
DEC 01 2020
IEPA-BOL
PERMIT SECTION

Re: Brandis Aircraft, The Paint Shop
Taylorville, Illinois
0210600007 - Christian County
Certification of Closure

Dear Mr. Smith:

On behalf of our client, Brandis Aircraft (The Paint Shop), enclosed is an original and 3 copies of the request for certification of closure for previously-operated SO1 (container storage) and TO4 (tank treatment) units at The Paint Shop, located at 2207 S. Spresser St. in Taylorville, Illinois. This facility has continued to operate as a less than LQG with less than 90-day storage since closure. All waste is sent off-site for disposal under a manifest. If you have any questions or comments please feel free to contact me at 217/787-2334 or akmett@andrews-eng.com. Thank you.

Respectfully yours,

Allison S. Kmett

Allison S. Kmett, P.E.
Project Engineer

ASK:JM

Enclosures

cc: Stephen F. Hedinger – Sorling Northrup Attorneys (email)
Robert Brandis – The Paint Shop (email)

R000002

MEMORANDUM

Date: November 25, 2020

Subject: Closure Certification and Documentation for <90-Day Unit

As described in this memorandum, closure of the less than 90-day (<90-day) container storage area located in The Paint Shop meets the applicable closure performance standards in 35 Illinois Administrative Code (Ill. Adm. Code) 725.211 and 214.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons that manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

R Brandis — 11/25/2020

Robert Brandis, Facility Operator — Date

Allison S. Kmett — 11/25/2020

Allison S. Kmett, P.E. — Date

Engineer Seal

LICENSED PROFESSIONAL ENGINEER
ALLISON S. KMETT
062-064239
STATE OF ILLINOIS

Exp 11/30/2021

Nature of Storage Operation

Hazardous wastes were stored in the <90-day storage area located in The Paint Shop. (Figure 1). The types of waste stored in this area included:

- Paint Chips
- Paint "Pucks"
- Water Treatment solids
- Aluminum conditioner and cleaner rinse waters
- Solvent stripper rinse waters

Closure Performance Standards

As this area was used to store RCRA hazardous wastes, the closure performance standards of 35 Ill. Adm. Code 725, which can be found in 35 Ill. Adm. Code 725.211 and 725.214, apply to closure of this area. These closure performance standards are briefly summarized below.

The closure performance standards of 35 Ill. Adm. Code 725.211 are:

a) *Minimize the need for further maintenance;*

b) *Control, minimize, or eliminate to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and*

c) *Complies with the closure requirements of 35 Ill. Adm. Code 725, including, but not limited to the requirements of…* (this section goes onto reference various unit specific closure regulations, none of which are applicable to container storage areas).

The closure performance standard of 35 Ill. Adm. Code 725.214 is:

> *During the partial and final closure periods, all contaminated equipment, structures and soil must be properly disposed of or decontaminated unless specified otherwise in Sections 725.297, 725.328, 725.358, 725.380, or 725.410. By removing all hazardous wastes or hazardous constituents during partial and final closure, the owner or operator may become a generator of hazardous waste and shall handle that hazardous waste in accordance with all applicable requirements of 35 Ill. Adm. Code 722.*

Leak, Spill History

A review of the weekly inspection logs was completed to determine whether any documented leaks, spills, or releases occurred at this waste management unit. The logs did not indicate any reports or evidence of leaks or spills.

Compliance with Closure Performance Standards

Below is a review of compliance with the applicable RCRA closure performance standards.

35 Ill. Adm. Code 725.211(a) – Minimizes the Need for Further Maintenance

R000006

When in operation, containers were placed on spill containment pallets; no leaks or spills were noted in the routine weekly inspection reports. The method of closure described herein complies with 35 Ill. Adm. Code 725.211(b) and 725.214, thus minimizing the need for further maintenance, as required by the performance standards in 35 Ill. Adm. Code 725.211(a).

35 Ill. Adm. Code 725.211(b) – Control, minimize or eliminate, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate.....

Based upon review of the inspection logs, the waste management unit was free of evidence of leaks, spills and releases during its period of operation.

Specific closure activities included the following:

First, all waste stored in this area was transported offsite for disposal. The concrete floor was then:

- Pressure washed
- Mopped
- A portion of the floor was coated with epoxy
- Swept

These activities were completed in 2014.

The inspection logs did not indicate the presence of a release; in addition the epoxy coatings provide an effective means for encapsulating any trace level contaminants, should they have existed, and is therefore protective of human health and the environment. Therefore, it appears the area meets the performance standard in 35 Ill. Adm. Code 725.211(b).

35 Ill. Adm. Code 725.211(c) – Complies with the closure requirements of 35 Ill. Adm. Code 725, including, but not limited to the requirements of.....

None of the specific regulations referenced in 35 Ill. Adm. Code 725.211(c) are applicable to container storage areas. Therefore, compliance with the referenced regulations is not applicable.

In addition, 35 Ill. Adm. Code 725, Subpart I – Use and Management of Containers, does not contain specific requirements related to closure of container storage areas.

As such, it appears closure of this area meets the performance standard in 35 Ill. Adm. Code 725.211(c).

35 Ill. Adm. Code 725.214 – During the partial and final closure periods, all contaminated equipment, structures and soil must be properly disposed of, or decontaminated unless specified otherwise in Sections 725.297, 725.328, 725.358, 725.380 or 725.410.

Based upon the absence of spills and releases, as verified by a review of the inspection logs, no structures or soil were ever impacted by the activities at this waste management unit.

Conclusions

The RCRA closure performance standards identified in 35 Ill. Adm. Code 725.211 and 214 have been met; thus, no post-closure care requirements are necessary

This memorandum shall be placed in the file documenting that the RCRA closure performance standards were achieved.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276 · (217) 782-3397

JB Pritzker, Governor	John J. Kim, Director

217/524-3300	7020 1290 0002 1665 7907

APR 21 2021

The Paint Shop
Attn: Michael Brandis
2207 S. Spresser Street
Taylorville, Illinois 62568

IEPA
Division of Records Management
Releasable

MAY 13 2021

Reviewer: MDB

RE: 0210600007—Christian County
Brandis Aircraft, The Paint Shop
ILD 982 621 690
Log No. C-900
RCRA Closure File

Dear Mr. Brandis:

This is in response to the certification of closure submittal by Allison S. Kmett, P.E. of Andrews Engineering on your behalf dated November 25, 2020 and received by the Illinois EPA on December 1, 2020. It appears this submittal responds to the Illinois EPA May 16, 2014 RCRA inspection and subsequent September 19, 2014 Violation Notice.

The Certification of Closure is hereby denied for the following reasons: 1. The Paint Shop has not demonstrated that the closure performance standards of 35 Ill. Adm. Code 725.211 were met. 2. A closure plan was not submitted or approved for the container storage area (S01) and waste treatment tank (T04) as required by 35 IAC 725.212. Therefore, Brandis Aircraft must submit to the Illinois EPA a RCRA Closure Plan for review.

This RCRA Closure Plan must be submitted to the Illinois EPA within 60 days of the date of this letter. Guidance for preparing this RCRA Closure Plan may be found online at www2.epa.state.il.us.

When the facility has completed RCRA closure of the hazardous waste container storage area (S01) and hazardous waste treatment (T04) area in accordance with an approved plan, a new Certification of Closure must be submitted. This certification must detail all the work completed as approved by the RCRA Closure Plan.

This letter shall constitute Illinois EPA's final decision on the subject submittal. The applicant may appeal this final decision to the Illinois Pollution Control Board pursuant to Section 40 of the Act by filing a petition for a hearing within 35 days after the date of issuance of the final decision. However, the 35-day period may be extended for a period of time not to exceed 90 days by written notice from the applicant and the Illinois EPA within the initial 35-day appeal period. If the owner or operator wishes to receive a 90- day extension, a written request that includes a statement of the date the final decision was received, along with a copy of this decision, must be sent to the Illinois EPA as soon as possible.

For information regarding the request for an extension, please contact:

Illinois Environmental Protection Agency
Division of Legal Counsel
1021 North Grand Avenue East
Post Office Box 19276
Springfield, IL 62794-9276
217/782-5544

For information regarding the filing of an appeal, please contact:

Illinois Pollution Control Board, Clerk
State of Illinois Center
100 West Randolph, Suite 11-500
Chicago, IL 60601
312/814-3620

Work required by this letter, your submittal, or the regulations may also be subject to other laws governing professional services, such as the Illinois Professional Land Surveyor Act of 1989, the Professional Engineering Act of 1989, the Professional Geologist Licensing Act and the Structural Engineering Act of 1989. This letter does not relieve anyone from compliance with these laws. All work that falls within the scope and definition of these laws must be performed in compliance with them. The Illinois EPA may refer any discovered violation to the appropriate regulating authority.

Should you have any questions regarding this letter, please contact William T. Sinnott, II at 217/524-3310.

Sincerely,

Kenneth E. Smith

Kenneth E. Smith, P.E., Manager
Permit Section
Division of Land Pollution Control
Bureau of Land

KES:WTS:0210600007-RCRA-C-900-Denial.docx
WTS

cc: Alison S. Kmett, P.E., Andrews Engineering
Stephen F. Hedinger, Sorling Northrup
Fred C. Prillaman, Sorling Northrup

bcc: Bureau File
Spfld Regional Office
Rob Watson
William Sinnott
Greg Richardson

BOL Permit Section RCRA Tracking Sheet

BOLSiteCode ***0210600007*** *FedID:* ***ILD982621690*** *Respond by:* ***5/20/2021***

Site: ***Paint Shop, The*** *Region:* ***Springfield***

City: Taylorville *County:* Christian

Facility Permit Universe: ☐ **OperatingUniverse** ☐ **PostClosureUniverse** ☐ **CorrActionUniverse** ☐ **UIC**

Facility Type: ***Right-to-Know Status:*** ***RTK Status Change Date:***

Site Comments:

Data Regarding Log #: *C-900*

Review Status	PermitClass	AppType	Reviewers: RCRA	CAU	DAU	GU
Inactive	New Closure Plan	Post-Closure	WTS			

LogComments:

Submittals for Log

DocTitle_Description	Submittal Type	Review Type	Agency Response
Request for certification of closure for previously operated SO1 and TO4 units at the plant shop	1st Submittal	Technical	

Submittal Received: 12/01/2020 **Date Due:** 03/01/2021 **Pub Notice/Date Mailed:**

Submittal Comments:

Final Action Data

For Log No: C-900

Units Addressed	Final Action Status	Date FA Issued	Date NFA	Date Closure Cert Accepted	Acres Remediated
	Denied	04/21/2021			0

Closure Type:	Institutional Control	Clean Closed:	1 Institutional Control:	2 Institutional Control:
	☐			

BOL Permit Section RCRA Tracking Sheet

BOLSiteCode ***0210600007*** *FedID:* ***ILD982621690*** *Respond by:* ***3/5/2021***

Site: ***Paint Shop, The*** *Region:* ***Springfield***

City: Taylorville *County:* Christian

Facility Permit Universe: ☐ **OperatingUniverse** ☐ **PostClosureUniverse** ☐ **CorrActionUniverse** ☐ **UIC**

Facility Type: ***Right-to-Know Status:*** ***RTK Status Change Date:***

Site Comments:

Data Regarding Log #: *C-900*

Review Status	PermitClass	AppType	Reviewers: RCRA	CAU	DAU	GU
Active	New Closure Plan	Post-Closure	WTS			

LogComments:

Submittals for Log

DocTitle_Description	Submittal Type	Review Type	Agency Response
Request for certification of closure for previously operated SO1 and TO4 units at the plant shop	1st Submittal	Technical	

Submittal Received: 12/01/2020 **Date Due:** 03/01/2021 **Pub Notice/Date Mailed:**

Submittal Comments:

Final Action Data

For Log No: C-900

Units Addressed	Final Action Status	Date FA Issued	Date NFA	Date Closure Cert Accepted	Acres Remediated
					0

Closure Type:	Institutional Control	Clean Closed:	1 Institutional Control:	2 Institutional Control:
	☐			

REVIEW NOTE CHECKLIST
General Information

0210600007—Christian County
The Paint Shop
ILD 982 621 690
Log C-900

Start of Review (Date)	**April 8, 2021**
Project Manager	William T. Sinnott, II
Groundwater Unit Reviewer	N/A
Corr. Action Reviewer	William T. Sinnott, II
Brief Description of Project	The facility is undergoing RCRA Closure of a hazardous waste container storage area and treatment area.
Site Name/Location	The Paint Shop 2207 S. Spresser St. Taylorville, Illinois
Facility Contact ☒ - Operator ☐ - Owner	Brandis Aircraft (The Paint Shop) Michael Brandis 2207 S. Spresser St. Phone #: Email:
Owner ☒ - Same as Facility Contact	Brandis (The Paint Shop) Michael Brandis 2207 S. Spresser St. Taylorville, Illinois Phone #: Email:
Consultant	Andrews Engineering Allison S. Kmett, P.E. 3300 Ginger Creek Drive Springfield, Il 62711 Phone #:(217) 787-2332 Email:akmett@andrews-eng.com
Siting (<u>Sec. 3.330 of Act</u>) <u>Cert. of Siting (LPC-PA8)</u>	☐-Yes ☐-No ☒-NA
Environmental Justice Area (See <u>Procedure I.28</u>) Chrome SWAP <u>EJ Database (EJ DB)</u>	a. EJ Area: ☐-Yes ☒-No ☐-N/A[1] (only applies to permit applications). Should be marked "Yes" if either SWAP or EJ DB evaluation indicates EJ concerns. b. EJ Evaluation: i. SWAP Results: ☒-Not located in EJ Area ☐-Blue (1) Minority ☐-Yellow (2) Low Income ☐-Red (3) Minority & Low Inc. ii. EJ DB Results: ☒-(0) Not EJ Area ☐-(1) Minority ☐-(2) Low Income ☐-(3) Minority & Low Income ☐-(99) Status Unknown

[1] For Environmental Justice Area reviews, the term "permit applications" means permit applications for various types of waste management facilities, including RCRA corrective actions and (CCDD) fill operations. It does not include uncontaminated soil fil operations (USFO), beneficial use determinations (BUD's) or general correspondence (PS Corr). See Footnote 1 from Procedure I.28.

	iii. If SWAP or EJ DB results identify EJ concerns submit EJ Review request to Community Relations via EJ DB. Complete Item c. below. c. Community Relations EJ Response: • ☐-Complete – No Outreach • ☐-Complete – With Outreach • ☐-Outreach in Progress Document Community Relations response by attaching a copy of the email response to the review notes. Notes:
39(i) Certification 39(i) Cert. form (LPC 643) **a. Review** (See Procedure I.25, 39(i) Investigations Memo & Sec. 39(i) of the Act)	☒-Not Applicable as this is not an application for a RCRA permit, permit modification, waste storage site, landfill/disposal site, transfer station, treatment facility, incinerator, waste transportation, CCDB fill operation, or tire storage site. **Review of 39(i) Certification**: **I. Applicant Information**: ☐-Complete/adequate ☐-Not complete/not adequate **II. Officers & Employees**: ☐-Complete/adequate ☐-Not complete/not adequate **III. Owner, Operator, Officer, and Employee Information**: A. Prior Conduct Identification: ☐-Yes ☐-No: Are one or more of the questions in this section marked "Yes"? If so, an Attachment A must be included (see below). B. Pending Proceedings: ☐-Yes ☐-No: Are one or more of the questions in this section marked "Yes"? If so, an Attachment A must be included (see below). C. Prior Application Information: i. ☐- Yes ☐-No: Are Previously submitted Attachment A's incorporated into this Certification? ii. ☐- Yes ☐-Not complete/adequate: If C.i. is checked yes; are the applications containing the previously submitted Attachment A's identified? **Certification Statement**: ☐-Yes ☐-Not complete/not adequate: Has the certification been signed by responsible corporate officer who meets the requirements of 702.126(a)(1)? **Attachment A – Information for Individual Persons:** Required if item III A. and/or B. above is check Yes. ☐-N/A ☐-Yes ☐-Not complete/adequate: Attachment A has been completed and contains the required information for individuals, identified in Section II that have prior findings, convictions or pending proceedings.
b. FACES Database Review FACES-DB FACES – 39i Guidance FACES User Manual	☐-Yes ☒-No: Facility has more than two consent decrees? If "Yes" request Full Compliance History (FCH), see item c. below. Notes:
c. Full Compliance History (FCH) Review	FCH Requested: ☐-Yes ☒-N/A: If item b above is checked yes request the FCH for the facility from the Waste Reduction and Compliance Section. Date FCH request made:

d. Other Information	**Other Information:** ☐-Yes ☒-No: Other information has been identified that suggest that applicant has not been truthful, or information provided is incomplete. Other information can be from public comments, news reports, personal knowledge, etc.
e. 39i violations identified that may require permit denial.	☐-Yes ☒-No: 39i violations identified that may require permit denial. If yes, a memo to the Unit Manager should be prepared detailing the violations. i. ☐-A memo, dated ____________, has been forwarded to the Unit Manager for evaluation.
f. Revised Permit Condition for 39(i)	☐-Yes ☒-N/A: Permit Condition ____________ has been revised to require the submittal of 39(i) Certification Forms with all applications (see item 4 of Procedure I.25).
Field Office Section	a. FOS Region/Contact: Paul Eisenbrandt Email: paul.eisenbrandt Phone: b. Field Inspection Required: ☐-Yes ☒-No If yes, a memo/email should be prepared and sent to the FOS contact, copy FOS Regional Manager. i. ☐-A memo/email, dated ____________, has been forwarded to the FOS. c. Comments Received from FOS: ☐-Yes ☒-No
CROPA Memo Procedure I.31 CROPA Template	a. ☐-Yes ☒-No: CROPA Memo prepared and Memo sent on ____________. i. ☐-Yes ☐-No: Permit(s) required from other Bureaus?
Name Change Requested	a. ☐-Yes ☒-No If yes: • ☐-Reviewer has completed Site Inventory Data Input Form **-OR-** • ☐-Facility has submitted an Illinois EPA Inventory Application.
Right to Know Evaluation Sec. 25d of Act Right-to-Know Evaluation form Right-to-Know Fact Sheet	a. ☒-N/A, no release near the property boundary has been documented, **-OR-** b. ☐-Soil, soil gas and/or groundwater contamination warranted a Right-to-Know Evaluation form be completed. The evaluation determined: • ☐-Further evaluation required. • ☐-Additional information is required to make an evaluation. • ☐-No criteria met, site does not warrant further evaluation. If an evaluation has been conducted the form must be attached to the review notes. Notes:

R000020

The Paint Shop
0210600007—Christian County
ILD 982621690
RCRA Closure
Log No. C-900
By: William T. Sinnott, II
Review Notes

WTS 4.19.2021

Subject Submittal
On November 25, 2020 Allison S. Kmett, P.E. of Andrews Engineering submitted a Certification of Closure which was received by the Illinois EPA on December 1, 2020. This certification of closure was for previously-operated S01 Container Storage and T04 Tank Treatment.

Facility Operations
The Paint Shop removes paint from aircraft followed by painting these same aircraft.

The following are a list of documents retrieved from Docuware. This list provides all that was readily available on Docuware.

1. **Field Operations Inspections**

August 29, 2003—Field Operations Section Inspection
September 25, 2003—Field Operations Section Letter
May 16, 2014—Field Operations Section Inspection
February 27, 2018—Field Operations Section Inspection

2. **RCRA Closure**

During a search of the RCRA Closure on Docuware a December 17, 1996 No Further Action letter was issued to Brandis Aircraft located in Taylorville, Illinois. This letter was the most recent letter in the RCRA Closure file. This NFA letter was for the RCRA Closure of a different unit at the site, a hazardous waste storage tank under Log No. C-556.

The other facility operating out of the same building goes by Evergreen Aviation. There were no RCRA Closure files available during my search however there were multiple inspections. This facility performs mechanical work on aircraft.

Closure Activities
According to this report the following activities were conducted:
First, all waste stored in this area was transported offsite for disposal. The concrete floor was then:

1. Pressure washed
2. Mopped
3. A portion of the floor was coated with epoxy
4. Swept

Figure 1 is not provided. This is an integral part of the RCRA Closure to provide a Site Layout Map to better understand where the regulated units lie within the facility and the size of the alleged RCRA Units. As discussed above, a portion of the floor was coated with epoxy. Without a Site Layout Map to depict the dimensions of the floor which were coated with epoxy, it is difficult to determine how effective this work is. The same concept holds for Pressure Washed and the bounds associated with this.

These activities were completed in 2014. The facility does not provide the rationale for not presenting this information shortly after completing the waste removal and decontamination.

Paint Chips and "Pucks", water treatment solids, aluminum conditioner and cleaner rinse waters, and solvent stripper rinse waters were stored in the paint shop in <90-day storage.

According to the Certification of Closure "a review of the weekly inspection logs did not indicate any reports or evidence of leaks or spills".

Review Notes
The facility does not provide any information regarding the closure of the T04 unit.
It is unclear if there was an approved RCRA Closure Plan for the hazardous waste container (S01) storage area and hazardous waste treatment (T04) area as there are no RCRA Closure Plan approval letters in Docuware.

The independent licensed Professional Engineer did not make a determination if there was a release if there were cracks, joints, etc. that would provide a pathway to the underlying soil. If there was an approved RCRA Closure Plan this would have been required. If this pathway exists is required to collect soil samples from beneath the concrete for subsequent analysis. The parameters to be sampled for would include Volatile Organic Compounds using Test Method 8240 of SW-846, Semi-Volatile Organic Compounds Using Test Method 8270 of SW-846 and RCRA Metals using Test Method 1311 of SW-846.

An approved RCRA Closure Plan would require for these concrete surfaces to be steam cleaned and triple rinsed followed by an inspection of the concrete discussed above.

The facility did not provide manifests for waste removed off-site as well as the rinsate generated during decontamination of the concrete floor.

The facility did not discuss the decontamination of the TO4 unit and the underlying concrete surfaces. Nor did it discuss the volume and dimensions of this unit.

The report discusses the RCRA Closure performance standards of 35 Illinois Administrative Code 725.211 and 725.214. These standards were not met as outlined in the discussion above. These Closure Performance standards apply when a facility is going thru RCRA Closure however, it has been determined the facility does not have an approved RCRA Closure Plan. Because the facility is not working under an approved RCRA Closure Plan the Illinois EPA must request the facility to do so.

More detail on these regulations is provided below. This clearly does not meet these requirements.

Section 725.211 Closure Performance Standard

The owner or operator must close the facility in a manner that does the following:

a) The closure minimizes the need for further maintenance;

b) The closure controls, minimizes, or eliminates, to the extent necessary to adequately protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and

c) The closure complies with the closure requirements of this Part, including, but not limited to, the requirements of Sections 725.297, 725.328, 725.358, 725.380, 725.410, 725.451, 725.481, 725.504, and 725.1102.

Section 725.214 Disposal or Decontamination of Equipment, Structures, and Soils

During the partial and final closure periods, all contaminated equipment, structures, and soil must be properly disposed of, or decontaminated unless specified otherwise in Section 725.297, 725.328, 725.358, 725.380, or 725.410. By removing all hazardous wastes or hazardous constituents during partial and final closure, the owner or operator may become a generator of hazardous waste and must handle that hazardous waste in accordance with all applicable requirements of 35 Ill. Adm. Code 722.

File Review
I performed a file review of the paper RCRA Closure available. This review indicated there are no paper files beyond 2010.

On September 19, 2014 Illinois EPA issued Violation Notice L-2014-01131 indicating hazardous waste was stored or treated without a permit.

According to a December 10, 2014 letter from Sorling Northrup, the facility proposes to secure clean closure of both units. On Page 3, their attorneys state they will provide clean closure documentation and certification.

On December 26, 2014 Illinois EPA indicated not to issue a proposed CCA for these violations. Due to the nature and seriousness of the violations, the IEPA has determined that these violations my not be able to be resolved without the involvement of the Office of the Attorney General, the Christian County State's Attorney, or the USEPA.

A May 16, 2014 RCRA Inspection Report indicated the facility has stored hazardous waste and treated hazardous waste without a RCRA Permit

According to the February 27, 2018 RCRA Inspection Report, failure to have a closure plan 35 IAC 725.212(a) is a continuing violation and the site does not have a RCRA Permit.

Final Action to be Taken
The Illinois EPA will deny the Certification of Closure. The Paint Shop will be required to submit a RCRA Closure Plan.

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

R000025 P, n/c
C-556-M-12

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

217/524-3300

December 17, 1996

CERTIFIED MAIL
Z 363 621 115

RELEASABLE

DEC 6 2007

REVIEWER M

Mr. L.J. Brandis, Jr.
Brandis Aircraft
Route 48 West
Taylorville, Illinois 62568

Re: 0210600007 -- Christian County
Brandis Aircraft
ILD982621690
Received: September 17, 1996, October 17, 1996 and November 21, 1996
Log No. C-556-M-12
RCRA Closure

Dear Mr. Brandis:

This letter is in response to the following documents prepared by Andrew Environmental Engineering Inc.(AEEI), on behalf of Brandis Aircraft (Brandis), for the RCRA closure of the hazardous waste storage tank (SO2) unit at the Brandis facility in Taylorville, Illinois:

1. The September 17, 1996 letter from AEEI notifying the IEPA of the completion of four (4) quarters of groundwater monitoring at the Brandis facility. Based upon these results, the IEPA was requested to waive the Appendix I sampling specified by Condition No. 9 in the August 17, 1996 closure plan approval letter from the IEPA, and approve clean closure relative to groundwater;

2. The September 17, 1996 letter and attachments from AEEI which included groundwater monitoring results, piezometric surface maps and a discussion of sampling protocol;

3 The October 17, 1996 **RCRA Closure Report,** providing certification of closure documentation that clean closure has been achieved. The August 17, 1995 final closure plan (Log No. C-556-M-11) for the hazardous waste storage tank (S02) at the Brandis Aircraft facility required Brandis to sample soil in the area of the subject unit to confirm that soil removal and air stripping were effective in remediating VOCs (methylene chloride and phenol) detected in soil during closure activities. This submittal included the soil test results from confirmation samples collected inside and outside of Building 1; and

4. The November 21, 1996 letter from AEEI which included a diagram showing the location of the soil samples collected from Building 1, and a revised Professional Engineering Certification.

A review of the September 17, 1996 groundwater documentation has determined that it shall not be necessary to monitor groundwater for Appendix I parameters. The four (4) groundwater sampling events conducted at the Brandis facility have produced the analytical results in accordance with the criteria found in the approved closure plan. Constituents of concern have not been detected in groundwater samples during any of the sampling events. Therefore, the facility may be clean closed relative to groundwater.

A review of the October 17, 1996 Closure Report has determined that the soil confirmation test results tested meet the current criteria used i.e., Title 35 IAC Part 742 - Tiered Approach to Corrective Action Objectives (proposed), to determine clean closure.

Certification was signed by Robert Brandis, the owner/operator, and Russel C. Waller, P.E. as an independent registered professional engineer. In addition, the subject unit was inspected by a representative of the IEPA on December 3, 1996. The inspection revealed that the unit was closed in accordance with the August 17, 1995 (Log No. C-556-M-11) IEPA closure plan approval letter, except certification per the Illinois Department of Public Health for the proper plugging and abandonment of remaining wells, peizometers, and deep borings. Therefore, the IEPA has determined that closure of the hazardous waste container storage tank (S02) at the Brandis facility has apparently met the requirements of 35 IAC 725 and closure certification may be approved with the following conditions:

1. Brandis shall complete the plugging and abandonment activities for groundwater monitoring wells 2D, 4D, 6D, and 8D within 60 days from the date of this letter.

2. The Brandis facility is no longer subject to the requirements of 35 IAC 725 for the hazardous waste tank but, must continue to meet the requirements of 35 IAC 722 and 729 as a generator of hazardous waste.

3. The Brandis facility shall not be required to have any RCRA related financial assurance documents established with the IEPA.

Should you have any questions regarding this letter, please contact Karen Nachtwey at 217/524-3273 or Terri Blake Myers at 217/524-3284.

Sincerely,

Edwin C. Bakowski. P.E.
Manager, Permit Section
Bureau of Land

ECBKEN\mls\96222.WPD
JKM:kit

cc: Andrews Environmental Engineering Inc. - Russel C. Waller, P.E.
Mohan, Alewelt, Prillaman & Adami - Stephen F. Hedinger

bcc: Bureau File
Springfield Region
Kenn Liss
Jim Moore
Terri Blake Myers
DLC, Greg Richardson
Karen Nachtwey

R000028

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

BUREAU OF LAND / FIELD OPERATIONS SECTION

RCRA INSPECTION REPORT

GENERAL FACILITY INFORMATION

USEPA ID #:	ILD982621690		**IEPA ID #:**	0210600007	
Facility Name:	The Paint Shop*			**Phone #:**	217/824-8032
Location	Adjacent and east of Evergreen Aviation - 2301 S. Spresser*			**County:**	Christian
City:	Taylorville	**State:**	Illinois	**Zip Code:**	62568
Region:	5 - Springfield	**Inspection Date:**	Aug. 29, 2003	**Time:**	14:40 -16:10
Weather:	76 ° F - Light Rain				

RECEIVED

SEP 29 2003

IEPA-BOL

TYPE OF FACILITY

Notified As:	Gen - 2	**Regulated As:**	Gen-2

TYPE OF INSPECTION

CEI: ☒	**CME/O&M:** ☐	**CSI:** ☐	**NRR:** ☐	**CCI:** ☐	**PIF:** ☐	**CVI:** ☐	**CSE:** ☐	**CAO:** ☐
FUI to:	**Other:**							

NOTIFICATION INFORMATION (EPA 8700-12)

Notification Date:	02-21-1989** **(initial)**	04-28-94** **(subsequent)**

PART A PERMIT INFORMATION (EPA 3510-3 OR EPA 8700-23)

Part A Date:	**Amended:**	**Withdrawn:**

PART B PERMIT INFORMATION

(Check one if applicable) Application Submitted? ☐	**Permit Issued?** ☐	**Date:**

ACTIVE ENFORCEMENT

Date facility referred to:	**USEPA:**	**IAGO:**	**County State's Attorney:**

RELEASABLE

OCT 08 2003

REVIEWER MD

ACTIVE ENFORCEMENT ORDERS

CACO:	**CAFO:**	**Federal Court Order:**
Consent Decree:	**IPCB Order:**	**State Court Order:**

* Formerly listed as Brandis Aircraft in USEPA and IEPA inventories. Initial notification included area known as Evergreen Aviation. The Paint Shop is separately owned/on a separate piece of property. The Paint Shop uses Evergreen's office address to receive mail/phone calls (See Narrative).

** Initial Notification following State Inspection. Subsequent date from second notification. Both listed site as a Gen-2.

TSD Facility Activity Summary

Activity by Process Code	On Part A?	On Part B?	Activity ever done?	Closed?	Being done during inspection?	Exempt per 35 IAC Sec:	On Annual Report:		
	☐	☐	☐	☐	☐		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐
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	☐	☐	☐	☐	☐		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐
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	☐	☐	☐	☐	☐		☐	☐	☐

SEP 29 2003

Owner

Name:	Summers Trust		
Address:	2301 S. Spresser***		
City:	Taylorville		
State:	Illinois	Zip Code:	62568
Phone #:	217/824-8032		

Operator

Name:	The Paint Shop		
Address:	2301 S. Spresser***		
City:	Taylorville		
State:	Illinois	Zip Code:	62568
Phone #:	217/824-8032		

Person(s) Interviewed	Title	Phone #
Bob Brandis	Manager	217/824-8032

Inspection Participants	Agency/Bureau	Phone #
Steve Townsend****	IEPA/BOL/DLPC/FOS-Spfld Region	217/786-6892

*** The Paint Shop is located adjacent to Evergreen Aviation and receives mail and phone calls at that location. The businesses are run as two separate entities owned by two different owners of record. There is no street address for The Paint Shop per Bob Brandis.

**** Report prepared by this person.

WD · 9/29/2003

RCRA Violations Checklist for CESQGs, SQGs, and Transporters

R000030

IEPA #: 0210600007 Inspection Date: 8/29/2003

Section	Area	V C R
CESQG Requirements		
Part 721		
721.102(f)	GOR	☐ ☐ ☐

CESQG Requirements for Exclusion from Full Regulation – Mark the checkboxes of any unmet exclusion criteria, but cite the resulting violations under the SQG Requirements.

Part 721
- ☐ 721.105(f)
- ☐ 721.105(g)

Part 722
- ☐ 722.111

Section	Area	V C R
Part 808 – Special Waste Determination		
808.121(a)		☐ ☐ ☐
SQG Requirements		
Part 722		
722.111	GGR	☒ ☐ ☒
722.112(a)	GGR	☐ ☐ ☐
722.112(c)	GGR	☐ ☐ ☐
722.120(a)	GMR	☐ ☐ ☐
722.120(b)	GMR	☐ ☐ ☐
722.120(d)	GMR	☐ ☐ ☐
722.120(e)	GMR	☐ ☐ ☐
722.121(a)	GMR	☐ ☐ ☐
722.121(b)	GMR	☐ ☐ ☐
722.122	GMR	☐ ☐ ☐
722.123(a)	GMR	☐ ☐ ☐
722.123(b)	GMR	☐ ☐ ☐
722.123(c)	GMR	☐ ☐ ☐
722.140(a)	GRR	☐ ☐ ☐
722.140(c)	GRR	☐ ☐ ☐
722.140(d)	GRR	☐ ☐ ☐
722.142(b)	GRR	☐ ☐ ☐
722.143	GRR	☐ ☐ ☐
Part 728		
728.107(a)(10)	GLB	☐ ☐ ☐
Part 808 – Special Waste Determination		
808.121(a)		☐ ☐ ☐

SQG Permit Exemption Criteria

The generator must comply with certain sections of Parts 722, 725, and 728. Mark the checkboxes of any unmet criteria, but cite the violation as 703.121(a) and (b), not as the unmet criteria.

Section	Area	V C R
703.121(a)	DOR	☒ ☐ ☒
703.121(b)	DOR	☐ ☐ ☐

Part 722
- ☐ 722.134(a)(2)
- ☐ 722.134(a)(3)
- ☐ 722.134(c)
- ☐ 722.134(d)
- ☒ 722.134(d)(5) resolved

Part 725
- ☐ 725.131
- ☐ 725.132
- ☐ 725.133
- ☐ 725.134
- ☐ 725.135
- ☒ 725.137 resolved
- ☐ 725.271
- ☐ 725.272
- ☐ 725.273(a)
- ☐ 725.273(b)
- ☐ 725.274
- ☐ 725.277
- ☐ 725.301(b)(1)
- ☐ 725.301(b)(2)
- ☐ 725.301(b)(3)
- ☐ 725.301(b)(4)
- ☐ 725.301(c)
- ☐ 725.301(d)
- ☐ 725.301(e)
- ☐ 725.301(f)

Part 728
- ☐ 728.107(a)(5)

Section	Area	V C R
Transporter Requirements		
Part 723		
723.111	TGR	☐ ☐ ☐
723.112	TGR	☐ ☐ ☐
723.120(a)	TMR	☐ ☐ ☐
723.120(b)	TMR	☐ ☐ ☐
723.120(c)	TMR	☐ ☐ ☐
723.120(d)	TMR	☐ ☐ ☐
723.120(e)	TMR	☐ ☐ ☐
723.120(f)	TMR	☐ ☐ ☐
723.120(g)	TMR	☐ ☐ ☐
723.120(h)	TMR	☐ ☐ ☐
723.121(a)	TMR	☐ ☐ ☐
723.121(b)	TMR	☐ ☐ ☐
723.122(a)	TMR	☐ ☐ ☐
723.122(b)	TMR	☐ ☐ ☐
723.122(c)	TMR	☐ ☐ ☐
723.122(d)	TMR	☐ ☐ ☐
723.122(e)	TMR	☐ ☐ ☐
723.130	TWD	☐ ☐ ☐
723.131	TWD	☐ ☐ ☐

Additional Requirements for CESQGs, SQGs and Transporters

Section	Area	V C R
		☐ ☐ ☐
		☐ ☐ ☐
		☐ ☐ ☐
		☐ ☐ ☐
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		☐ ☐ ☐

V = Violation Observed; C = Continuing; R = Resolved | **NA = Not Applicable; NE = Not Evaluated**

IEPA - BOL/FOS MEMORANDUM

DATE: September 18, 2003

TO: DLPC/Division File

FROM: S. Townsend, DLPC/FOS

SUBJECT: LPC # 0210600007 - Christian County
Taylorville/The Paint Shop
ILD982621690
FOS FILE

GENERAL REMARKS

On August 29, 2003, this author conducted an inspection at the above referenced facility. This facility was listed as one facility with what is now listed as Evergreen Aviation (0210605081) under the name Brandis Aircraft, LPC # 0210600007 and USEPA # ILD982621690 in both the State and USEPA inventories. The original "Brandis" site numbers were assigned following an inspection in the late 1980's. During the August 29, 2003, inspection, and subsequent phone conversations, Mr. Bob Brandis stated that the facility listed as Brandis Aircraft in our and USEPA's inventories is in practice actually two facilities on two separately owned properties. This "facility" identified as Brandis Aircraft was initially inspected on July 19, 1988. A full inspection was conducted on October 26, 1988, resulting in enforcement being initiated, a site clean-up, and RCRA hazardous waste site closure. The Brandis Aircraft facility is listed as a small quantity generator (Gen-2) of hazardous waste in both the IEPA and USEPA databases. The notification dates are listed as February 21, 1989, for the initial notification and a subsequent notification on April 28, 1994. As part of the August 29, 2003, inspection I checked with DAPC and DWPC to see if there were any current outstanding violations or enforcement. I was advised that there were no current issues between this facility and DAPC or DWPC.

I arrived at the Evergreen Aviation office at 11:50 and introduced myself to Michael J. Brandis. He informed me that I needed to speak with his father Bob Brandis, who was gone at that time. He said I should speak with Bob Brandis after lunch after 1:15 p.m. (13:15). I returned to the Evergreen Aviation office at 13:20. I introduced myself to Bob Brandis and explained that I was there to inspect the site because it was listed as a generator of hazardous waste on the USEPA inventory. I answered Mr. Brandis' questions regarding how and why the inspection was to be done and went over some general site information. I was then told that the business listed in our data-base was in fact two businesses. The Paint Shop (0210600007) strips paint and repaints aircraft. Evergreen Aviation (0210605081), located next door to The Paint shop, conducts airplane inspections and does mechanical maintenance of aircraft. According to Mr. Bob Brandis, the facilities share an office but are run as two businesses. The office/mailing address for both facilities is located at 2301 S. Spresser on the Evergreen Aviation property. The physical address for The Paint Shop according to county records is 2207 S. Spresser. There is no office or mail-box for that physical address. I conducted the inspections simultaneously from that point and conducted physical inspections of both sites.

1. Products, Processes and Services

RELEASABLE

OCT 0 8 2003

REVIEWER MD

This facility strips and repaints aircraft.

2. and 3. Waste Generation, Accumulation and Disposition.

A. Waste Acid Stripper ~ Water Diluted - This waste is generated when formic acid stripper is rinsed off the plane or plane part being stripped. The waste drops into a trough in the floor. It is removed and placed in drums (up to 150 gallons) and is the run through a reclaiming machine, and accumulated again in drums (See photo 0210600007~08292003-002 and 003, site sketch, and Attachment F). The waste water is then reused to rinse stripper off in subsequent stripping operations (See item 5 below). The waste water was tested in-house and determined to have a pH in the 4.2 to 4.4 range. According to Bob Brandis, this system will be changed to directly remove the waste from the floor trough into a holding tank or drum directly connected to the reclaiming machine, all in a closed loop.

B. Waste Acid Stripper Solids (D002, F001) - This waste includes solids and other materials separated from the waste 'water portion reclaimed for reuse as rinse-water. This material is removed from the reclaiming unit and placed in drums near the reclaiming unit until it is hauled off-site. Currently, less than two drums per year are generated of this waste. This waste is disposed of at Pollution Control Industries in Indiana (IND000646943).

C. Spent Paint Booth Filters (non-hazardous) – paint booth filters are changed dry about every eight (8) months. According to Mr. Bob Brandis, based on materials used there is no indication that these would pose a disposal problem or be considered hazardous. The filters are disposed of as general refuse at a local landfill (See photo 0210600007~08292003-001, site sketch).

D. Solvent is used to clean the high solids paint gun. Currently the solvent is left in a small container where parts are soaked. The solvent evaporates and is replenished as needed. No waste solvent is currently generated as only a small amount is used and it evaporates during use.

4. Unusual Events, Occurrences, or Application of the Regulations

A. Mr. Brandis indicated there was a separating/reclaiming device used to remove solids from the wash water generated during the paint stripping processes. Mr. Brandis submitted a photo on September 12, 2003, showing that this had been installed, creating a true closed loop system to reclaim the wash water.

B. The manifest used on September 4, 2003, was used for wastes from the two sites. The manifest used only one site number (0210600007 – now The Paint Shop) for a shipment of both stripper wastes from The Paint Shop and waste oil from Evergreen Aviation. The Manifest lists Evergreen Aviation in the Generator's Name. Mr. Bob Brandis spoke with me via telephone regarding the waste pick-up. Specifically, we spoke about the using of one manifest for both sites. I told Mr. Brandis that Evergreen Aviation was a CESQG, and the second site, The Paint Shop, where paint stripping waste is generated had a number already. I also said that the sites were still listed as one site on the IEPA inventory. I told him that the future waste shipments must be under the site specific numbers for the two businesses once they were assigned, but that the additional pick-up from Evergreen Aviation, a CESQG, would not pose a problem for this shipment. In the future shipments from The Paint Shop (0210600007, ILD982621690) and Evergreen Aviation (0210605081) will list their respective names and site number that have now been assigned. The site number for Evergreen Aviation (0210605081) was assigned on September 5, 2003. As long as Evergreen Aviation qualifies for the CESQG exemption, no federal I.D. number will be necessary.

5. Exemptions

This facility will likely become a conditionally exempt small quantity generator now that the facility installed a "closed loop" wash waster reclaimer. They were a reduced requirement small quantity generator (gen-2) at the time of the inspection (see regulatory status).

6. Regulatory Status

This facility generates about two drums of wastewater maximum in a month from the paint stripping operation. This wash water is reclaimed and reused, generating an additional 55 gallons per year of solids from the reclaiming process. Both waste streams added together total a waste generation of less than 1000 kg maximum in a month. This facility was a gen-2 at the time of the inspection and is thus being reported as such in this report. With the installation of a closed loop system, the two drums of wash water will need to be counted only the first time it is subsequently generated, provided the reclaimed material remains usable as an alternative raw material. The solids will be counted as generated as they are removed each month. The waste generation will likely much less than 100 kg per month in the future based on current rates of generation. As a result, this facility will likely be considered a Conditionally Exempt Small Quantity Generator (CESQG) in the future.

7. Attachments

A. Christian County Property Ownership Records – This attachment includes twenty-four (24) pages of information showing the transfer of property. This document was faxed and sent via mail to my by Joe Stepping of Christian County Solid Waste Management.

B. USEPA Data Inquiries - Results for a USEPA database search on ILD982621690. This attachment includes 2 pages of information. This attachment shows Brandis Aircraft at this location.

C. LPC Number Request Form – This attachment includes a copy of the electronic form received with the LPC number assigned for Evergreen Aviation. This attachment includes one (1) page of information.

D. Manifest #IL 10264633 – This attachment is a copy of the fax cover sheet and manifest used to transport waste from both The Paint Shop (0210600007) and Evergreen Aviation (0210605081) on September 4, 2003. This attachment includes one (1) page of information.

E. Fax of Requested Information #1 – This attachment is a copy of the information on the pH meter used to test the waste and waste water, operating procedure for the reclaimer unit, and MSDS for the chemicals used in the reclaimer unit to reclaim the waste water. This attachment includes eight (8) pages of information.

F. Fax of Requested Information #2 - This attachment is a copy of the Land Disposal

Restrictions Form attached to the September 4, 2003, waste manifest, the emergency information posted near the telephone following the inspection, the letters submitted to local emergency response organizations following the inspection to document an attempted agreement, the map posted near the phone showing the fire extinguishers and exits, and the photo of the new closed loop system. This attachment includes seven (7) pages of information.

8. Apparent Violations

Section 722.111 - - Hazardous Waste Determination – This facility did not have information regarding the hazardous waste and land disposal restriction (LDR) determination for wash water and reclaimed wash water waste available during the on-site inspection. Mr. Brandis faxed this information via a copy of the manifest LDR form showing that such a determination has been made and documented following the inspection. These documents resolved this apparent violation.

Section 722.134 - - Preparedness and Prevention - Compliance with 725.137 – Agreements with Local Emergency Response Organizations (LEROs)– This facility did not have documentation for agreements or attempted agreements from LEROs to aid or respond in the event of an emergency. Mr. Brandis faxed a copy of letters to these organizations following the inspection. These documents resolved this apparent violation.

703.121(a)

MD 9/24/2003

Section 722.134(d)(5) - - Preparedness and Prevention – Posted information near phone - This facility did not have required information posted near the phone. Mr. Brandis faxed this information via a copy of a phone number posting and site map that were placed near the phone. These documents resolved this apparent violation.

9. Comments

This facility submitted records to document compliance during the writing of this report. This facility has corrected the deficiencies noted during the inspection.

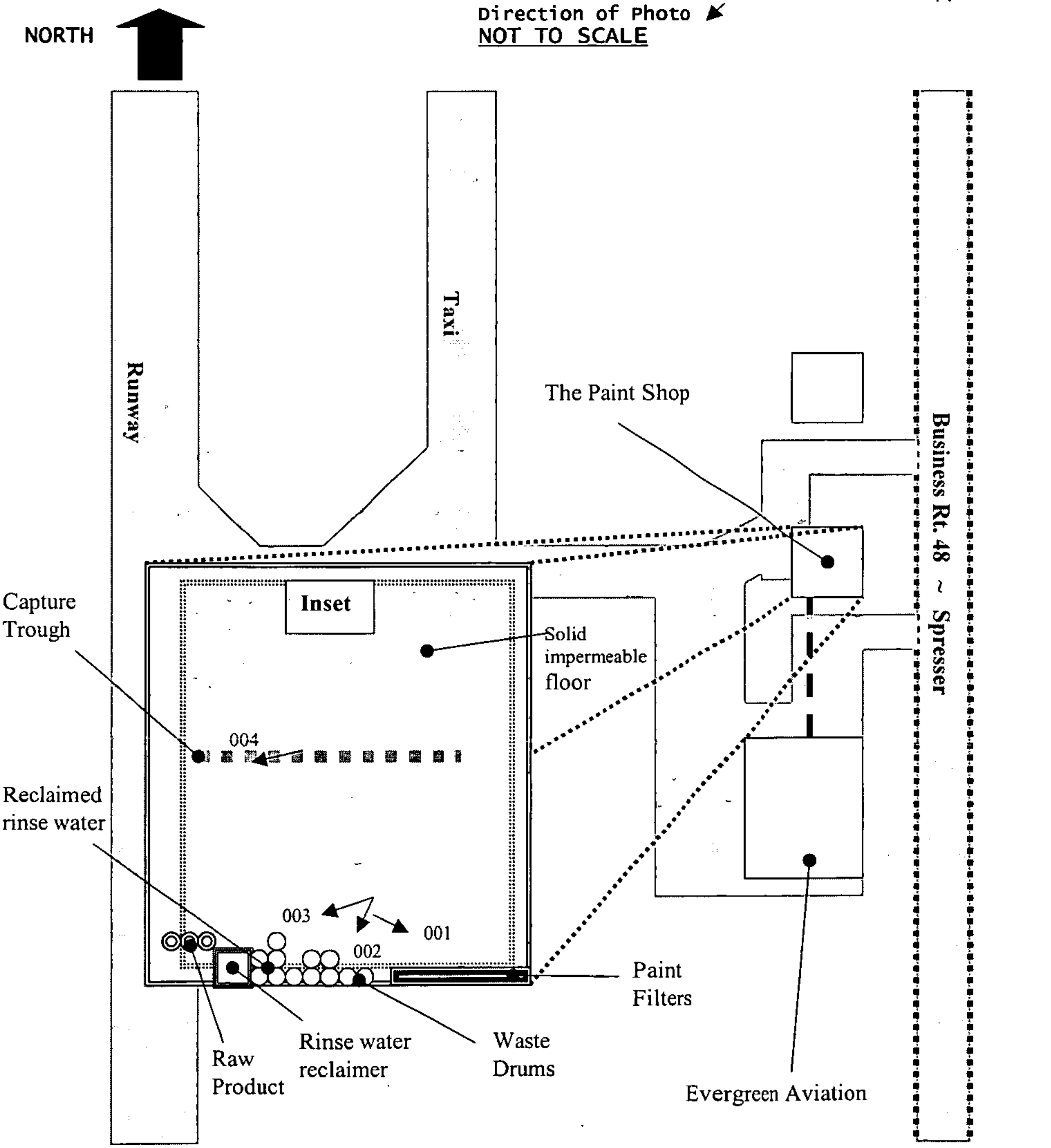
cc: DLPC/FOS-Springfield Region

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
SITE SKETCH

Date of Inspection: August 29, 2003
Site Code: 0210600007
Site Name: The Paint Shop
Photo File # 0210600007~08292003

Inspector: S. Townsend
County: Christian
Time: 13:20 to 16:10
Measurements Approximate

Direction of Photo
NOT TO SCALE



The appearance Some of the images

following this page is due to

Poor Quality Original Documents

and not the scanning or filming processes.

Com Microfilm Company
(217) 525-5860

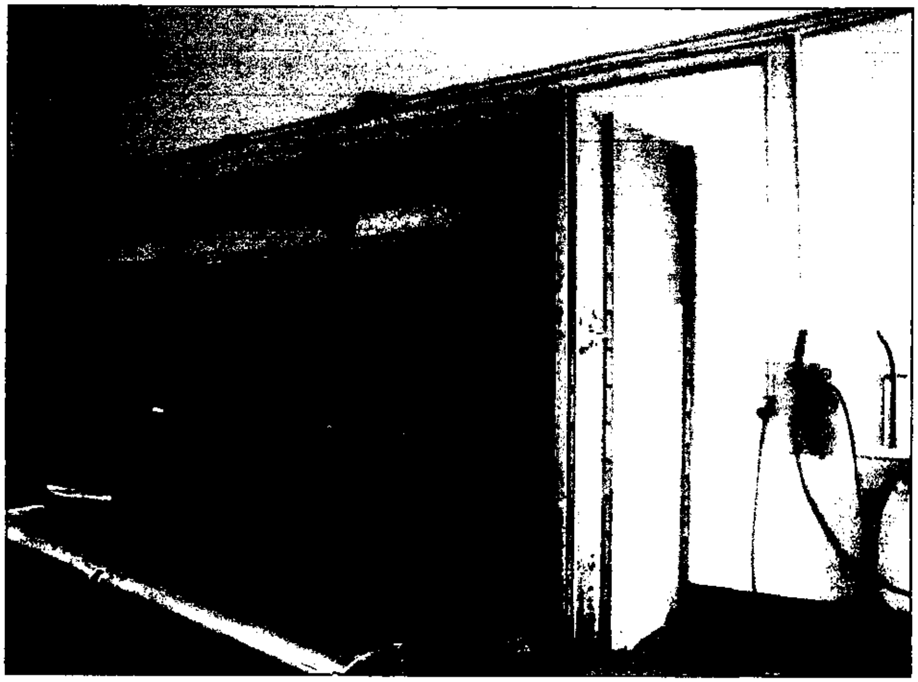
J:\toolbox\poorDocs.doc

Illinois Environmental Protection Agency
Bureau of Land

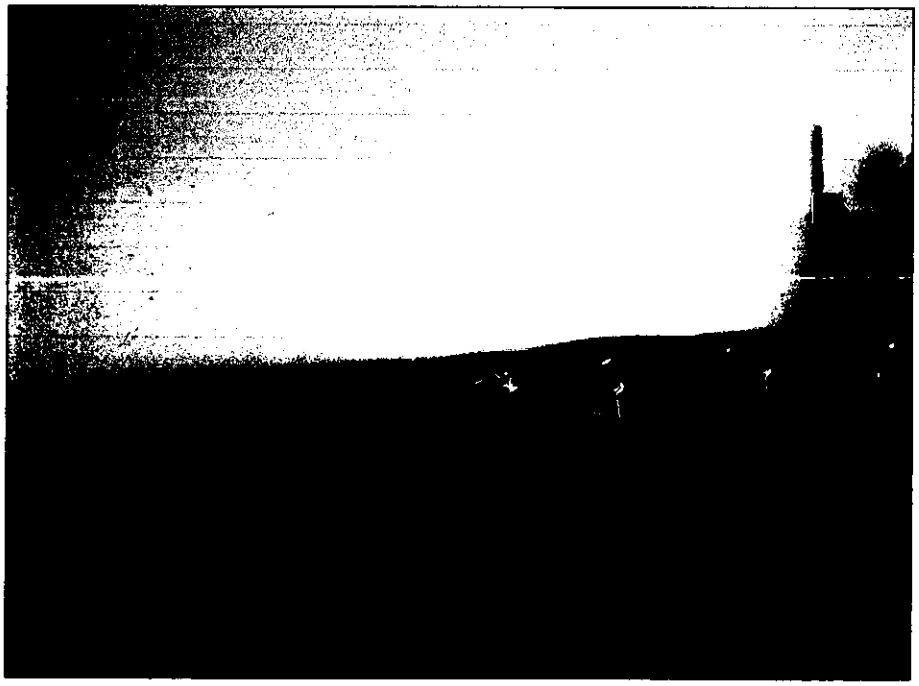
DIGITAL PHOTOGRAPHS

LPC # 0210600007 - Christian County
Taylorville/The Paint Shop
FOS File

Date: August 29, 2003
Time: 15:18
Direction: SE
Photo by: S. Townsend
Photo File Name:
0210600007~08292003-001
Comments:
Paint booth filters



Date: August 29, 2003
Time: 15:19
Direction: S-SW
Photo by: S. Townsend
Photo File Name:
0210600007~08292003-002
Comments:
Waste drums (2) and several reclaimed rinse water drums

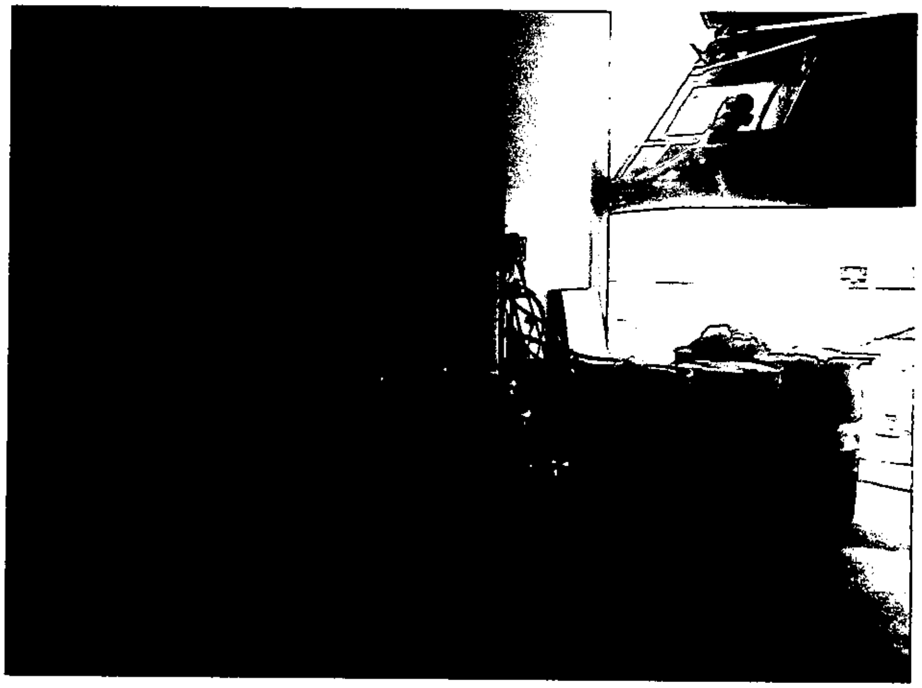


Illinois Environmental Protection Agency
Bureau of Land

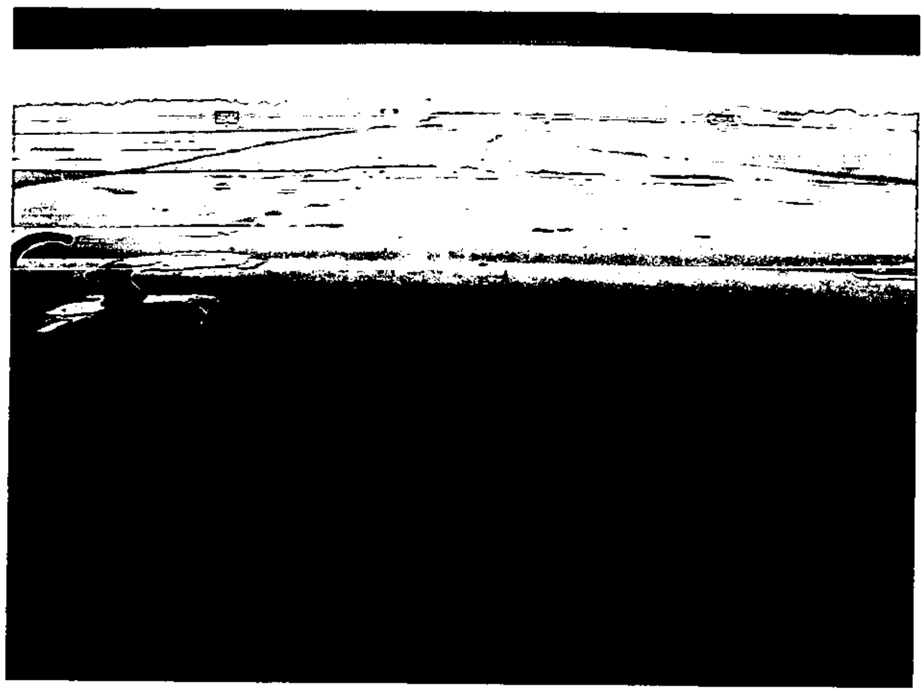
DIGITAL PHOTOGRAPHS

LPC # 0210600007 - Christian County
Taylorville/The Paint Shop
FOS File

Date: August 29, 2003
Time: 15:19
Direction: W-SW
Photo by: S. Townsend
Photo File Name:
0210600007~08292003-003
Comments:
Reclaimed rinse water and raw product Formic Acid drums. Rinse water reclamation unit along the wall between rinse water and acid product drums.



Date: August 29, 2003
Time: 15:21
Direction: W
Photo by: S. Townsend
Photo File Name:
0210600007~08292003-004
Comments:
Capture trough for acid stripper recovery.



R000039

HAZARDOUS WASTE DISPOSITION FORM

Facility Name:	The Paint Shop	**USEPA ID #:**	ILD982621690
Inspection Date:	August 29, 2003	**IEPA ID #:**	0210600007

Waste Name	Generating Process	Last Analysis Date	USEPA HW #	On Notif.? (8700-12)	On Part A? (3510-3 or 8700-23)	On Annual Report for Years:			Amount On-Site	Gener-ation Rate	Last Mani-fest Date	Disposition
						2000	2001	2002				
Waste Formic Acid Solution	Reclaiming rinsate with caustic strp	2003	D002, F002	☒	N/A	N/A	N/A	N/A	100+/- gallons	30 gal or less/ Month Max.	9-4-03	Combined with #2 sent off site as haz even though accumulated separately as non-haz
Stripping waste-water from Formic Acid strip	Stripping paint from Airplanes/parts	2003	D002, F002 & N/A	☒	N/A	N/A	N/A	N/A	None	110 gal Once*	N/A	Reclaimed and reused to further rinse stripper from planes on-site.
Paint Booth Filters	Change paint-booth filters	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Local refuse hauler to Local Landfill
				☐	☐	☐	☐	☐				
				☐	☐	☐	☐	☐				
				☐	☐	☐	☐	☐				
				☐	☐	☐	☐	☐				
				☐	☐	☐	☐	☐				
				☐	☐	☐	☐	☐				

* Water was initially used to rinse formic acid stripper from planes. This wash water was collected, treated and recontainerized and is now being reused to rinse subsequent paint strippings. This system is now a closed loop system where the collected rinsate is put directly into the treatment system as collected. The treatment system adjusts pH slightly and causes spent stripper solids to precipitate out. The "solids" are collected from the treatment unit and sent off site as the waste listed above as Waste Formic Acid Solution. Some water is added to replace water lost/evaporated in the process.

0210600007 - *Christian County* *ILD982621690* R000049 *8-29-2003*
Taylorville/The Paint Shop

Regulation	RCRA SMALL-QUANTITY GENERATOR INSPECTION CHECKLIST (PART 722)	Violation
	PART 722: STANDARDS APPLICABLE TO SMALL-QUANTITY GENERATORS OF HAZARDOUS WASTE (100 - 1000 KG/MO.)	
	SUBPART A: GENERAL	
722.111	**Section 722.111 Hazardous Waste Determination** Has the generator correctly determined if the solid waste(s) it generates is a hazardous waste? Yes____ No RTC N/A____	RTC
	Have hazardous wastes been identified for purposes of compliance with Part 728? Yes____ No____ N/A____	722.111
808.121(a)	Has the generator correctly determined if the solid waste it generates is a special waste? Yes X No____ N/A____	808.121(a)
722.112(a)	**Section 722.112 USEPA Identification Numbers** Has the generator obtained a USEPA identification number? Yes X No____ N/A____	722.112(a)
722.112(c)	Has the generator offered its hazardous waste only to transporters or to treatment, storage or disposal facilities that have a USEPA identification number? Yes X No____ N/A____	722.112(c)
	SUBPART B: THE MANIFEST	
722.120(a)	**Section 722.120 General Requirements** Does the facility manifest its waste off-site? Yes X No____ N/A____ If "No", proceed to Section 722.120(e).	722.120(a)
722.120(b)	Does the manifest designate a facility permitted to handle the waste? Yes X No____ N/A____	722.120(b)
722.120(d)	Has the generator shipped any waste that could not be delivered to the designated facility? Yes____ No X N/A____	722.120(d)
722.120(e)	Does the generator reclaim waste through a contractual agreement with a recycling facility in which: - the type of waste and frequency of shipments are specified in the agreement? Yes____ No____ N/A X - the vehicle used to transport the waste to the recycling facility and to deliver regenerated material back to the generator is owned and operated by the reclaimer of the waste? Yes____ No____ N/A X - the generator has maintained a copy of the agreement for 3 years after termination or expiration of the agreement? Yes____ No____ N/A X	722.120(e) No contractual *agreement used*
728.107(a)(10)	Has a small-quantity generator with a tolling (contractual) agreement pursuant to Section 722.120(e) retained on site a copy of the notification and certification of the initial waste shipment together with the tolling agreement for at least 3 years after the termination or expiration of the agreement? Yes____ No____ N/A X	728.107(a)(10)
722.121(a)	**Section 722.121 Acquisition of Manifests** Has the generator used: - an Illinois manifest for wastes designated to a facility within Illinois? Yes____ No____ N/A X	722.121(a)
722.121(b)	- a manifest from the State to which the manifest is designated? Yes____ No____ N/A X - an Illinois manifest if the State to which the waste is designated has no manifest of its own? Yes X No____ N/A____	722.121(b)
722.122	**Section 722.122 Number of Copies** Does the manifest consist of at least 6 copies? Yes X No____ N/A____	722.122

Regulation	RCRA SMALL-QUANTITY GENERATOR INSPECTION CHECKLIST (PART 722)	Violation
	Section 722.123 Use of the Manifest For each manifest reviewed, has the generator:	
722.123(a)	- signed the certificate by hand? Yes__X__ No____ N/A____ - obtained the handwritten signature and the date of acceptance by the initial transporter? Yes__X__ No____ N/A____ - retained one copy as required by Section 722.140(a)? Yes__X__ No____ N/A____ - apparently sent a copy (part 5 for the Illinois manifest) to the Agency within 2 working days? Yes__X__ No____ N/A____	722.123(a)
722.123(b)	- has the generator apparently given the remaining copies to the transporter? Yes__X__ No____ N/A____	722.123(b)
722.123(c)	- has the generator followed the procedures prescribed in Section 722.123 for manifesting bulk shipments of hazardous waste by rail or water? Yes____ No____ N/A__X__	No Bulk *Shipments* 722.123(c)
	SUBPART C: PRE-TRANSPORT REQUIREMENTS Is there any hazardous waste ready for transport off-site? Yes____ No__X__ N/A____ If so, is the generator complying with the pre-transport requirements in Subpart C? Yes____ No____ N/A__X__	
(722.134(c))	**Section 722.134 Accumulation Time** Is the generator who accumulates hazardous waste at or near any point of generation where wastes initially accumulate and which is under the control of the operator of the process generating the waste, limiting such accumulation to 55 gallons of hazardous waste or 1 quart of **acutely** hazardous waste, complying with Sections 725.271, 725.272 and 725.273(a), and marking the containers with the words "Hazardous Waste" or other words to identify the contents? Yes____ No____ N/A__X__ Has the generator who accumulates more than 55 gallons of hazardous waste or 1 quart of **acutely** hazardous waste complied with the requirements of Section 722.134(a) within 3 working days? Yes__X__ No____ N/A____ If there are more than 55 gallons of hazardous waste or 1 quart of **acutely** hazardous waste in the satellite accumulation area, are the containers marked with the date accumulation began? Yes____ No____ N/A__X__ During the 3 day period, is the generator continuing to comply with the requirements of Section 722.134(c)(1) with respect to the excess waste? Yes__X__ No____ N/A____	RTC
(722.134(d))	Has the generator complied with the following requirements: Yes____ No____ N/A__X__ **Note:** If the quantity of hazardous waste on-site ever exceeds 6000 kg, the facility is also a storage facility subject to full regulation under Parts 724 and 725 and the permit requirements under Part 703. Does the facility accumulate hazardous waste in containers? Yes__X__ No____ N/A____ If "No", go to Subpart J.	722.134(d) See 725.137 *and/or 722.134(d)(5) below X*
(722.134(a)(2))	**SUBPART I: USE AND MANAGEMENT OF CONTAINERS** Is the accumulation start date marked on each container? Yes__X__ No____ N/A____	
(722.134(a)(3))	Is each container marked with the words "Hazardous Waste"? Yes__X__ No____ N/A____	
(725.271)	If the containers have leaked or are in poor condition, has the owner/operator transferred the hazardous waste to a suitable container? Yes____ No____ N/A__X__	No such event

Regulation	**RCRA SMALL-QUANTITY GENERATOR INSPECTION CHECKLIST (PART 722)**	**Violation**
(725.301(c))	Is the generator inspecting, where present, the following: 1) discharge control equipment at least once each operating day? Yes______ No______ N/A______ 2) data from monitoring equipment at least once each operating day? Yes______ No______ N/A______ 3) the level of the waste in the tank at least once each operating day? Yes______ No______ N/A______ 4) physical evidence of corrosion at least weekly? Yes______ No______ N/A______ 5) discharge confinement structures to detect erosion or leaking at least weekly? Yes______ No______ N/A______	
(725.301(d))	Has the generator removed all hazardous waste from tanks and associated equipment and structures upon closure of the facility? Yes______ No______ N/A______	
(725.301(e))	If ignitable or reactive wastes are stored in tanks, is the generator in compliance with Section 725.301(c)? Yes______ No______ N/A______	
(725.301(f))	Is the generator in compliance with the regulations concerning incompatible wastes in Section 725.301(f)? Yes______ No______ N/A______	
	COMMENTS:	
	SUBPART C: PREPAREDNESS AND PREVENTION	
(725.131)	Is the facility being operated and maintained to minimize the possibility of a fire, explosion or any release of hazardous waste or hazardous waste constituents which could threaten human health or the environment? Yes__X__ No______ N/A______	
(725.132)	Is the facility equipped with the following if necessary: a) an internal communication or alarm system(s)? Yes______ No______ N/A__X__ b) a telephone or other device to summon emergency assistance from local authorities? Yes__X__ No______ N/A______ c) portable fire extinguishers, fire control equipment, spill control equipment and decontamination equipment? Yes__X__ No______ N/A______ d) water at adequate volume and pressure for fire control? Yes__X__ No______ N/A______	
(725.133)	Is the facility testing and maintaining communication/alarm systems, fire protection equipment, spill control equipment and decontamination equipment? Yes__X__ No______ N/A______	
(725.134)	a) Where hazardous waste is being handled, do all employees have immediate access to an internal alarm or other emergency communication device? Yes__X__ No______ N/A______ b) If there is ever just one employee on the premises when the facility is operating, does he/she have immediate access to a device capable of summoning external emergency assistance? Yes__X__ No______ N/A______	
(725.135)	Is the facility maintaining adequate aisle space? Yes__X__ No______ N/A______	

Regulation	RCRA SMALL-QUANTITY GENERATOR INSPECTION CHECKLIST (PART 722)	Violation
(725.272)	Is the waste compatible with the container and/or liner? Yes__X__ No____ N/A____	
(725.273(a))	Are containers of hazardous waste always closed except to remove or add waste during accumulation? Yes__X__ No____ N/A____	
(725.273(b))	Are containers of hazardous waste being opened, handled, or stored in a manner which will prevent the rupture of the container or prevent it from leaking? Yes__X__ No____ N/A____	
(725.274)	Is the owner/operator inspecting the accumulation area(s) at least weekly, looking for leaks or deterioration? Yes__X__ No____ N/A____ Is the accumulation area free from any evidence of leaking or deteriorating containers? (See also Section 725.131) Yes__X__ No____ N/A____	
(725.277)	Is the owner/operator complying with the requirements concerning incompatible wastes? Yes____ No____ N/A__X__ Does the generator accumulate and/or treat hazardous waste in tanks? Yes____ No__X__ N/A____ **Note:** If "No", go to Subpart C. COMMENTS:	
	SUBPART J: TANK SYSTEMS **Section 725.301 Generators of 100 to 1000 kg/mo.**	
(722.134(a)(2))	Is each tank marked with the words "Hazardous Waste"? Yes____ No____ N/A____	
(725.301(b)(1))	Is the generator in compliance with the treatment or storage of hazardous waste in tanks as referenced in Section 725.117(b)? Yes____ No____ N/A____	
(725.301(b)(2))	Have hazardous wastes or treatment reagents been placed in a tank causing the tank or its inner liner to rupture, leak, corrode or otherwise fail before the end of its intended life? Yes____ No____ N/A____	
(725.301(b)(3))	Unless a tank is equipped with drainage control or a diversion structure, do any uncovered tanks have at least 2 feet of freeboard? Yes____ No____ N/A____	
(725.301(b)(4))	If waste is continuously fed into a tank, is the tank equipped with a means to stop the inflow (i.e. waste feed cutoff system or by-pass system to a stand-by tank)? Yes____ No____ N/A____	

Regulation	RCRA SMALL-QUANTITY GENERATOR INSPECTION CHECKLIST (PART 722)	Violation
(725.137)	Has the facility attempted to make the following arrangements, as appropriate, for the type of facility and waste: - arrangements with local emergency authorities (i.e. police and fire departments, other emergency response agencies) to familiarize them with the layout of the facility, properties of hazardous waste handled, places where facility personnel would be working, entrances to roads inside the facility and evacuation routes? Yes______ No__*RTC*__ N/A______ - agreements designating the primary authority where more than one police or fire department might respond? Yes______ No__*RTC*__ N/A______ - agreements with State emergency response teams, contractors and equipment suppliers? Yes______ No__*RTC*__ N/A______ - arrangements to familiarize local hospitals with the properties of hazardous waste handled at the facility and the type of injuries or illnesses which could result from fires, explosions or releases at the facility? Yes______ No__*RTC*__ N/A______	According to Mr. *Bob Brandis some arrangements have been made. Documentation for such arrangements was absent during the inspection. Letters were written and submitted following the inspection. The building also had a fire hazard plaque on the building following the fire department touring the buildings and advising the business.*
(728.107(a)(5))	**Section 728.107 Waste Analysis and Recordkeeping** Has the generator who treats a prohibited waste in tanks or containers in order to meet the treatment standards developed and followed a waste analysis plan? Yes______ No______ N/A__X__ Is the plan on-site? Yes______ No______ N/A__X__ Does the plan include a detailed physical and chemical analysis? Yes______ No______ N/A__X__ Has the plan been filed with the Agency at least 30 days prior to commencement of treatment activity? Yes______ No______ N/A__X__ Has the generator submitted the required notification and certification that the waste meets treatment standards when the waste is shipped off-site? Yes______ No______ N/A__X__	
(722.134(d)(5))	A) Is there at least one employee on site or on call with the responsibility to coordinate all emergency response measures? Yes__X__ No______ N/A______ B) Is the following information posted next to the telephone: - the name and telephone number of the emergency coordinator? Yes______ No__*RTC*__ N/A______ - the location of fire extinguishers and spill control equipment and, if present, fire alarms? Yes______ No__*RTC*__ N/A______ - the number of the fire department unless the facility has a direct alarm? Yes______ No__*RTC*__ N/A______ C) Have employees received the proper waste handling and emergency procedures training relevant to their positions? Yes__X__ No______ N/A______ D) If there have been any emergencies that required a response, did the emergency coordinator comply with the requirements of Section 722.134(d)(5)(D)? Yes______ No______ N/A__X__ **Note:** A small-quantity generator who must transport the waste over a distance of 200 miles or more for treatment, storage or disposal may accumulate waste on-site for up to 270 days without a permit provided that the generator complies with the requirements of subsection (d).	No phone posting *was present. Mr. Bob Brandis faxed a copy of the posted information following the inspection.*
722.140(a)	**SUBPART D: RECORDKEEPING AND REPORTING** **Section 722.140 Recordkeeping** Has the generator retained for a period of 3 years: - a copy of each signed manifest? Yes__X__ No______ N/A______	
		722.140(a)
722.140(c)	Has the generator retained for a period of 3 years: - copies of test results, waste analyses or other determinations made in accordance with Section	

Regulation	RCRA SMALL-QUANTITY GENERATOR INSPECTION CHECKLIST (PART 722)	Violation
	722.111? Yes__X__ No____ N/A____	722.140(c)
722.140(d)	Does a generator who is involved in any unresolved enforcement action or as requested by the Director continue to maintain the records required in subsections a) and c)? Yes____ No____ N/A__X__	722.140(d)
722.142(b)	**Section 722.142 Exception Reporting** Has the generator filed an exception report if a signed copy of the manifest has not been received within 60 days of the date of delivery to the transporter? Yes____ No____ N/A__X__	722.142(b)
722.143	**Section 722.143 Additional Reporting** Has the generator furnished additional reports as required by the Director? Yes__X__ No____ N/A____	722.143
722.150	**SUBPART E: EXPORTS OF HAZARDOUS WASTE** Is the generator an exporter of hazardous waste? Yes____ No__X__ N/A____ If "Yes", has the generator complied with the requirements of Subpart E? Yes____ No____ N/A__X__	722.150
722.160	**SUBPART F: IMPORTS OF HAZARDOUS WASTE** Is the generator an importer of hazardous waste? Yes____ No__X__ N/A____ If "Yes", has the generator complied with the requirements of Subpart F? Yes____ No____ N/A__X__	722.160
722.170	**SUBPART G: FARMERS** Is the generator a farmer? Yes____ No__X__ N/A____ If "Yes", has the generator complied with the requirements of Subpart G? Yes____ No____ N/A__X__	722.170
	COMMENTS:	

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Regulation	RCRA LAND DISPOSAL RESTRICTIONS (PART 728)	Violation
	PART 728: RCRA LAND DISPOSAL RESTRICTIONS	
728.101	**Note:** This Part identifies 1) hazardous wastes that are restricted from land disposal and 2) those circumstances where otherwise prohibited wastes may continue to be land disposed. This Part applies to persons that generate or transport hazardous waste and to owners and operators of hazardous waste treatment, storage, and disposal facilities.	
728.101(c)	**Note:** Restricted wastes may continue to be land disposed as follows: 1) an extension has been granted to the effective date of a prohibition (728.105); 2) an exemption has been granted from a prohibition (728.106). 4) if the waste is hazardous only because it exhibits a characteristic, is treated by DEACT, or is a D003 reactive cyanide and meets any of the criteria below: i) the waste is managed in a treatment system that discharges to waters of the U.S. pursuant to a Part 309 permit (i.e. NPDES); ii) the waste is treated for purposes of the pretreatment requirements of Parts 307 and 310; or iii) the waste is managed in a zero discharge system engaged in CWA-equivalent treatment (728.137(a)); and iv) the waste no longer exhibits a characteristic at the point of land disposal.	
728.101(d)	**Note:** This Part does not affect the availability of a waiver under CERCLA Section 121(d)(4).	
728.101(e)	**Note:** The following hazardous wastes are not subject to any provision of this Part: 1) wastes generated by a CESQG (<100 Kg/month); 2) on-site disposal of waste pesticide by a farmer (722.170); 3) waste identified or listed as hazardous after 11/8/84 for which USEPA has not promulgated a land disposal prohibition or treatment standard; 4) de minimis losses of waste that exhibit a characteristic of hazardous waste to wastewaters; or 5) laboratory wastes mixed with other plant wastewaters as described in this subsection.	
728.101(f)	**Note:** Universal wastes are exempt from Sections 728.107 and 728.150.	
728.101(g)	**Note:** This Part is cumulative with the land disposal restrictions of Part 729.	
	SUBPART A: GENERAL **Section 728.103 Dilution Prohibited as a Substitute for Treatment** **Note:** A □Yes□ answer to any of the questions under Section 728.103 is a violation.	
728.103(a)	Has a person diluted a restricted waste or a treatment residual of a restricted waste as a substitute for adequate treatment? Yes____ No X N/A____	728.103(a)
728.103(b)	Has a person diluted a waste (that is hazardous only because it exhibits a characteristic) in a treatment system that discharges to waters of the State pursuant to an NPDES permit (Part 309), that treats wastes in a CWA-equivalent treatment system, or that treats wastes for purposes of pretreatment requirements under Part 310, using a method other than DEACT or for D003 reactive cyanide wastewater or nonwastewater? Yes____ No X N/A____	728.103(b)
728.103(c)	Is combustion of any of the wastes identified in Section 728.Appendix K occurring without meeting one or more of the criteria under this Section upon generation or after treatment? Yes____ No X N/A____	728.103(c)
728.103(d)	Has a person added iron to lead-containing hazardous wastes in order to achieve LDR treatment standards for lead? Yes____ No X N/A____	728.103(d)
728.104	**Section 728.104 Treatment Surface Impoundment Exemption** Are wastes that are otherwise prohibited from land disposal under this Part being treated in a surface impoundment that meets all of the conditions of this Section? Yes____ No X N/A____	728.104

0210600007 - *Christian County* *Taylorville/The Paint Shop*	*ILD982621690*	*8-29-2003*

Regulation	RCRA LAND DISPOSAL RESTRICTIONS (PART 728)	Violation
728.107(a)(1)	**Section 728.107 Waste Analysis and Recordkeeping** Has the generator determined if the waste has to be treated before it can be land disposed? Yes *X* No___ N/A___ **Note:** If the generator is managing a characteristic hazardous waste, then the generator shall comply with the special requirements of Section 728.109.	728.107(a)(1)
728.107(a)(2)	If a generator determines that its waste does not meet the treatment standards, has a one-time written notice been sent with the initial shipment to each treatment or storage facility (and placed a copy of the notice in the generator's file) that includes the following information (Section 728.Table I: Generator Paperwork Requirements): 1) USEPA hazardous waste manifest number of first shipment? Yes *X* No___ N/A___ 2) The statement: "The waste is subject to the LDRs"? Yes *X* No___ N/A___ **Note:** The constituents of concern for F001 through F005 and F039 and underlying hazardous constituents in characteristic wastes are required on the notice unless all constituents will be treated and monitored. 3) The applicable wastewater/nonwastewater category and subdivisions made within a waste code based on waste-specific criteria? Yes *X* No___ N/A___ 4) Waste analysis data (when available)? Yes *X* No___ N/A___ 5) When treating hazardous debris with alternative treatment technologies, the contaminants subject to treatment and an indication that these contaminants are being treated to comply with Section 728.145? Yes___ No___ N/A *X* **Note:** No further notification is necessary until such time that the waste or facility changes.	728.107(a)(2)
728.107(a)(3)	Has the generator of a restricted waste or contaminated soil that meets the applicable treatment standards sent a one-time written notice with the required certification statement (and placed a copy in the generator's file) to each TSDF receiving the waste? Yes___ No___ N/A *X* **Note:** The notice must include the information specified in Section 728.Table I: Generator Paperwork Requirements (column 728.107(a)(3)).	728.107(a)(3)
728.107(a)(4)	Has the generator of an exempt hazardous waste or contaminated soil sent a one-time written notice per Section 728.Table I: Generator Paperwork Requirements (column 728.107(a)(4)) to each LDF receiving the waste? Yes___ No___ N/A *X*	728.107(a)(4)
728.107(a)(5)	Has the generator developed, followed, and filed on-site a written waste analysis plan in accordance with this subsection for managing and treating prohibited hazardous waste or contaminated soil in tanks, containers, or containment buildings regulated under Section 722.134? Yes___ No___ N/A *X* **Note:** The notification requirements of subsection 728.107(a)(3) apply to wastes shipped off-site pursuant to this subsection 728.107(a)(5).	728.107(a)(5)
728.107(a)(6)	Has the generator retained on-site all supporting data used to make the determination, based on either knowledge of the waste or waste analysis data, that the hazardous waste or contaminated soil is restricted? Yes *X* No___ N/A___	728.107(a)(6)

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Regulation	RCRA LAND DISPOSAL RESTRICTIONS (PART 728)	Violation
728.107(a)(7)	Has the generator managing prohibited waste that is excluded from the definition of hazardous or solid waste or which is exempt from Subtitle C regulation (Sections 721.102 through 721.106), prepared and kept on-site a one-time notice of these exclusions or exemptions and the disposition of the waste? Yes____ No____ N/A X	728.107(a)(7)
728.107(a)(8)	Has the generator retained all copies of notices, certifications, waste analysis data, and other documentation produced pursuant to this Section for at least three years from the date such waste was last sent to on-site or off-site treatment, storage, or disposal? Yes X No____ N/A____	728.107(a)(8)
728.107(a)(9)	Has the generator managing lab packs using alternative treatment standards fulfilled the conditions of this subsection including the notice specified in Section 728.Table I: General Paperwork Requirements (column 728.107(a)(9))? Yes____ No____ N/A X	728.107(a)(9)
728.107(a)(10)	Has the small quantity generator (>100 - <1000 Kg/month) with a tolling agreement pursuant to Section 722.120(e) retained on-site a copy of the notice and certification of the initial waste shipment together with the tolling agreement for at least 3 years after the termination or expiration of the agreement? Yes____ No____ N/A X	728.107(a)(10)
728.107(b)	Has the treatment facility tested its waste or contaminated soil according to the frequency specified in its waste analysis plan as required by Sections 724.113 or 725.113 and subsections (b)(1) and (b)(2) of this section? Yes____ No____ N/A X	728.107(b)
728.107(b)(3)	Has the treatment facility sent a one-time written notice with the initial shipment to the land disposal facility and kept a copy at the treatment facility that includes the required information indicated in the Treatment Facility Paperwork Requirements Table? Yes____ No____ N/A X	728.107(b)(3)
728.107(b)(4)	Has the treatment facility submitted a certification, as specified in subsection 728.107(b)(4), with the initial shipment of waste, contaminated soil, or treatment residue of a restricted waste to the land disposal facility and placed a copy in the treatment facility's on-site files? Yes____ No____ N/A X **Note:** There are specific certification requirements for: B) debris excluded from the definition of hazardous waste; C) organic constituents having treatment standards expressed as concentration levels; D) characteristic waste treated on-site to remove the characteristic and then sent off-site for treatment of underlying hazardous waste constituents; and E) characteristic waste that contain underlying hazardous constituents that are treated on-site to remove the hazardous characteristics and to treat underlying hazardous constituents.	728.107(b)(4)
728.107(b)(5)	For waste or treatment residue that will be further managed at a different TSDF, is the treatment facility that sends the waste complying with the notification and certification requirements applicable to generators under Section 728.107(a)? Yes____ No____ N/A X	728.107(b)(5)
728.107(b)(6)	Has the recycling facility that is making off-site shipments of recyclable materials used in a manner constituting disposal: 1) submitted to the Agency a notice and certification with each shipment in accordance with 728.107(b)(3) and (b)(4)? Yes____ No____ N/A X 2) kept records of the name and location of each entity receiving the hazardous waste-derived product? Yes____ No____ N/A X	728.107(b)(6)
728.107(c)	Has owner or operator of any land disposal facility disposing any waste subject to restrictions under this Part: 1) maintained in its files copies of the notices and certifications specified in Sections 728.107(a) and (b)? Yes____ No____ N/A X	

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Regulation	**RCRA LAND DISPOSAL RESTRICTIONS (PART 728)**	**Violation**
	2) tested the waste or an extract of the waste or treatment residue according to the frequency specified in the facility's waste analysis plan (Section 724.113 or 725.113) to assure the waste or treatment residue meets the applicable treatment standards? Yes____ No____ N/A__*X*__	728.107(c)
	Note: If an owner or operator is disposing of any waste that is a recyclable material used in a manner constituting disposal subject to the provisions of Section 726.120(b), they are not subject to subsections 728.107(c)(1) through (c)(3).	
728.107(d)	Has the generator or treater who first claims that their hazardous debris is excluded from the definition of a hazardous waste under Section 721.103(e) provided the following notification and certification: 1) a one-time notification submitted to the Agency including the following information: A) the name and address of the RCRA Subtitle D facility receiving the treated debris? Yes____ No____ N/A__*X*__ B) a description of the hazardous debris as initially generated including the applicable USEPA hazardous waste code(s)? Yes____ No____ N/A__*X*__ C) for debris excluded under Section 721.103(e)(1), the technology from Section 728.Table F used to treat the debris? Yes____ No____ N/A__*X*__ 2) Has the notification been updated if the debris is shipped to a different facility, and, for debris excluded under Section 721.102(e)(1) if a different type of debris is treated, or if a different technology is used to treat the debris? Yes____ No____ N/A__*X*__ 3) For debris excluded under Section 721.103(e)(1), has the owner or operator of the treatment facility documented and certified compliance with the treatment standards of Section 728.Table F pursuant to this subsection? Yes____ No____ N/A__*X*__	728.107(d)
728.107(e)	Has the generator or treater that first receives a determination from USEPA or the Agency that a given contaminated soil subject to LDRs (Section 728.149(a)) no longer contains a listed hazardous waste or exhibits a characteristic of hazardous waste: 1) prepared a one-time only documentation of these determinations including all supporting information? Yes____ No____ N/A__*X*__ 2) maintained that information in the facility files and other records for a minimum of three years? Yes____ No____ N/A__*X*__	728.107(e)
728.109(a)	**Section 728.109 Special Rules for Characteristic Wastes** Has the initial generator of a solid waste determined each hazardous waste code applicable to the waste in order to determine the applicable treatment standards under Subpart D of Part 728? Yes__*X*__ No____ N/A____ **Note:** For purposes of this Part, the waste must carry the waste code for any applicable listing under Part 721, Subpart D and one or more of the waste codes under Part 721, Subpart C where the waste exhibits the relevant characteristic, except in the case when the treatment standard for the Subpart D waste code operates in lieu of the standard for the Subpart C waste code as specified in subsection (b). If the generator determines that its waste displays a characteristic of hazardous waste (and the waste is not D001 nonwastewaters treated by CMBST, RORGS, or POLYM of Section 728.Table C), has the generator determined the underlying hazardous constituents (as defined at Section 728.102) in the characteristic waste? Yes__*X*__ No____ N/A____	728.109(a)
(728.109(b))	**Note:** Where a prohibited waste is both listed and characteristic, the treatment standard for the listed waste code will operate in lieu of the standard for the characteristic waste code, provided that the treatment standard for the listed waste includes a treatment standard for the constituent that causes the waste to exhibit the characteristic. Otherwise, the waste must meet the treatment standards for all applicable	

0210600007 - *Christian County Taylorville/The Paint Shop*	*ILD982621690*	*8-29-2003*
Regulation	**RCRA LAND DISPOSAL RESTRICTIONS (PART 728)**	**Violation**
	exhibit the characteristic. Otherwise, the waste must meet the treatment standards for all applicable listed and characteristic waste codes.	
728.109(c)	Has the generator land disposed any prohibited waste that exhibits a characteristic under Part 721, Subpart C only if the waste complies with the treatment standards under Part 728, Subpart D (in addition to any applicable standards determined from the initial point of generation)? Yes____ No____ N/A _X_	728.109(c)
728.109(d)	Has the generator of a waste that no longer exhibits a characteristic placed a one-time notification and certification in the generator's or treater's files and sent a copy to the Agency (except for those facilities described in Section 728.109(f))? Yes____ No____ N/A _X_ Has the notification and certification been updated to reflect process or operational changes in waste generation or RCRA Subtitle D receiving facility changes? Yes____ No____ N/A _X_ Has the generator or treater notified the Agency annually (by December 31) of any such changes? Yes____ No____ N/A _X_	728.109(d)
728.109(d)(1)	Does the notification include: A) the name and address of the RCRA Subtitle D (municipal solid waste landfill) facility receiving the waste shipment; and B) a description of the waste as initially generated, including the applicable USEPA hazardous waste codes, the treatability group(s), and the underlying hazardous constituents (Section 728.102), unless the waste will be treated and monitored for all underlying hazardous constituents? Yes____ No____ N/A _X_ **Note:** If all underlying hazardous constituents will be treated and monitored, there is no requirement to list any of the underlying hazardous constituents on the notice.	728.109(d)(1)
728.109(d)(2)	Is the certification signed by an authorized representative and does the certification state the language found in either: Section 728.107(b)(4)? or Yes____ No____ N/A _X_ If treatment removes the characteristics but does not meet standards applicable to underlying hazardous constituents, Section 728.107(b)(4)(D)? Yes____ No____ N/A _X_	728.109(d)(2)
728.109(d)(3)	For a characteristic waste whose ultimate disposal will be into a Class I injection well, has the generator complied with this subsection? Yes____ No____ N/A _X_	728.109(d)(3)
728.109(e)	For a decharacterized waste managed on-site in a wastewater treatment system subject to Clean Water Act (CWA) or zero-dischargers engaged in CWA-equivalent treatment, has the generator monitored compliance with the treatment standards (Sections 728.148 and 728.Table D) quarterly (unless the treatment is aggressive biological treatment, in which case compliance must be monitored annually)? Yes____ No____ N/A _X_ Are monitoring results kept in on-site files for at least 5 years? Yes____ No____ N/A _X_	728.109(e)
728.109(f)	For a decharacterized waste managed on-site in a wastewater treatment system subject to CWA for which all underlying hazardous constituents are addressed by a CWA permit, has the generator kept compliance documentation in on-site files? Yes____ No____ N/A _X_	728.109(f)

Regulation	RCRA LAND DISPOSAL RESTRICTIONS (PART 728)	Violation
728.109(g)	For a characteristic waste whose ultimate disposal will be into a Class I injection well that qualifies for the de minimus exclusion described in Section 728.101, has the generator kept information supporting that qualification in on-site files? Yes______ No______ N/A__X__	728.109(g)
	SUBPART C: PROHIBITION OF LAND DISPOSAL	
728.130	**Section 728.130 Waste Specific Prohibitions - Wood Preserving Wastes** Has the generator of wood preserving wastes, soil, debris, and radioactive wastes soil and debris (F032, F034, or F035) land disposed the wastes only after having: 1) met the treatability standards of Part 728, Subpart D; or 2) been granted an exemption from prohibition pursuant to a petition under Section 728.106; 3) met the applicable treatment standards established pursuant to a petition granted under Section 728.144; or 4) been granted an extension to the effective date of prohibition pursuant to 40 CFR 268.5(See Section 728.105)? Yes______ No______ N/A__X__	728.130
728.130(e)	Has the generator of wood preserving wastes tested the waste or used knowledge of the waste to determine whether it exceeds the applicable treatment standards? Yes______ No______ N/A__X__	728.130(e)
728.131	**Section 728.131 Waste Specific Prohibitions - Dioxin-Containing Wastes** Has the generator of a dioxin-containing waste, soil and debris (F020, F021, F022, F023, F026, F027 or F028) land disposed the waste only after having: 1) met the treatability standards of Part 728, Subpart D; or 2) been granted an exemption from prohibition pursuant to a petition under Section 728.106; or 3) been granted an extension to the effective date of prohibition pursuant to Section 728.105? Yes______ No______ N/A__X__	728.131
728.132	**Section 728.132 Waste Specific Prohibitions – Soils Exhibiting the Toxicity Characteristic for Metals and Containing PCBs** Has the generator of any volumes of soil exhibiting the toxicity characteristic solely because of the presence of metals (D004 through D011) and containing PCBs, land disposed the waste only after having: 1) met the treatability standards of Part 728, Subpart D and the wastes contain halogenated organic compounds in total concentration less than 1,000 mg/kg; or 2) met the alternative treatment standards specified in Section 728.149 for contaminated soil and the wastes contain halogenated organic compounds in total concentration less than 1,000 mg/kg; or 3) been granted an exemption from prohibition pursuant to a petition under Section 728.106; or 4) met the applicable treatment standards established pursuant to a petition granted under Section 728.144? Yes______ No______ N/A__X__	728.132
728.133	**Section 728.133 Waste Specific Prohibitions – Chlorinated Aliphatic Wastes** Has the generator of K174 and K175 hazardous wastes, soil and debris contaminated with these wastes, radioactive wastes mixed with these wastes, and soil and debris contaminated with radioactive wastes mixed with these wastes land disposed the waste only after having: 1) met the treatability standards of Part 728, Subpart D; or 2) been granted an exemption from prohibition pursuant to a petition under Section 728.106; 3) met the applicable treatment standards established pursuant to a petition granted under Section 728.144; or 4) hazardous debris meet the treatment standards in Section 728.140 or the alternative treatment standards in Section 728.145; or 5) been granted an extension to the effective date of prohibition pursuant to Section 728.105? Yes______ No______ N/A__X__	728.133

Regulation	RCRA LAND DISPOSAL RESTRICTIONS (PART 728)	Violation
728.133(c)	Has the generator of chlorinated aliphatic wastes tested the waste or used knowledge of the waste to determine whether it exceeds the applicable treatment standards? Yes____ No____ N/A *X*	728.133(c)
728.133(d)	Have the K175 hazardous wastes that have been disposed in compliance with all applicable Section 728.140 treatment standards been macroencapsulated in accordance with Part 728, Table F unless the waste is placed in: 1) A RCRA Subtitle C monofill containing only K175 wastes that meet all applicable Section 728.140 treatment standards; or 2) A dedicated RCRA Subtitle C landfill cell in which all other wastes being co-disposed are at ≤pH 6.0? Yes____ No____ N/A *X*	728.133(d)
	Section 728.134 Waste Specific Prohibitions - Toxicity Characteristic Metal Waste **Note:** Toxicity Characteristic metal waste include, waste soils or debris carrying the D004 through D011 codes and slag from secondary lead smelters. Effective May 26, 2000 Toxicity Characteristic metal waste will include waste from elemental phosphorus processing and radioactive waste mixed with D004 - D011.	
728.134	Has the generator of toxicity characteristic metal waste, soil and debris land disposed the waste only after having: 1) met the treatability standards of Part 728, Subpart D; or 2) been granted an exemption from prohibition pursuant to a petition under Section 728.106; 3) met the applicable treatment standards established pursuant to a petition granted under Section 728.144; or 4) been granted an extension to the effective date of prohibition pursuant to Section 40 CFR 268.5? Yes____ No____ N/A *X*	728.134
728.134(f)	Has the generator of toxicity characteristic metal waste tested the waste or used knowledge of the waste to determine whether it exceeds the applicable treatment standards? Yes____ No____ N/A *X*	728.134(f)
728.135	**Section 728.135 Waste Specific Prohibitions - Petroleum Refining Wastes** Has the generator of petroleum refining wastes soil, debris, and radioactive wastes soil and debris (K169, K170, K171, and K172) land disposed of the waste only after having: 1) met the treatability standards of Part 728, Subpart D; or 2) been granted an exemption from prohibition pursuant to a petition under Section 728.106; 3) met the applicable treatment standards established pursuant to a petition granted under Section 728.144; 4) met the treatment standard in Section 728.140 and Table T for hazardous debris, or in the alternative, treatment standards in Section 728.145; or 5) been granted an extension to the effective date of prohibition pursuant to 40 CFR 268.5? Yes____ No____ N/A *X*	728.135
728.135(c)	Has the generator of petroleum refining wastes tested the waste or used knowledge of the waste to determine whether it exceeds the applicable treatment standards? Yes____ No____ N/A *X*	728.135(c)
728.137(a)	**Section 728.137 Waste Specific Prohibitions - Ignitable and Corrosive Characteristic Wastes Whose Treatment Standards Were Vacated** Has the generator of D001 (not in the High TOC Ignitable Liquids Subcategory) or D002 waste refrained from land disposal of these wastes in means other than Clean Water Act regulated discharges, Class I deep well injection or zero dischargers that engage in CWA-equivalent treatment before ultimate land disposal Yes____ No____ N/A *X*	728.137(a)
728.137(b)	Has the generator refrained from land disposal of any D001 (not in the High TOC Ignitable Liquid Subcategory) or D002 wastes managed in Class V injection wells that do not engage in CWA-equivalent	

Regulation	RCRA LAND DISPOSAL RESTRICTIONS (PART 728)	Violation
	Subcategory) or D002 wastes managed in Class V injection wells that do not engage in CWA-equivalent treatment before injection? Yes_____ No_____ N/A _X_	728.137(b)
	Section 728.138 Waste Specific Prohibitions - Newly Identified Organic Toxicity Characteristic Wastes and Newly-Listed Coke By-Product and Chlorotoluene Production Wastes	
728.138(a)	Has the owner or operator land disposed any of the following wastes: - K141, K142, K143, K144, K145, K147, K148, K149, K150 or K151; - Debris contaminated with F037, F038, K107 through K112, K117, K118, K123 through K126, K131, K132, K136, U328, U353, U359; - Soil and debris contaminated with D012 through D043, K141 through K145, or K147 through K151; or - D012 through D043 that are not radioactive, that are managed in systems other than those whose discharge is regulated under the CWA, that are zero dischargers that do not engage in CWA-equivalent treatment before ultimate disposal, or that are injected in Class I DEEP wells only after having: 1) met the treatability standards of Part 728, Subpart D; or 2) been granted an exemption from prohibition pursuant to a petition under Section 728.106; 3) met the applicable treatment standards established pursuant to a petition granted under Section 728.144; or 4) been granted an extension to the effective date of prohibition pursuant to 40 CFR 268.5? Yes_____ No_____ N/A _X_	728.138(a)
728.138(e)	Has the generator of the above wastes tested the waste or used knowledge of the waste to determine whether it exceeds the applicable treatment standards? Yes_____ No_____ N/A _X_	728.138(e)
	Section 728.139 Waste Specific Prohibitions - End-of-Pipe CWA, CWA-Equivalent, and Class I Nonhazardous Waste Injection Well Treatment Standards; Spent Aluminum Potliners; and Carbamate Wastes.	
728.139	Has the owner or operator land disposed any of the following wastes: 1) Hazardous soil and debris with the hazardous waste numbers K156 through K159, K161, P127, P128, P185, P188 through P192, P194, P196 through P199, P201 through P205, U271, U278 through U280, U364, U367, U372, U373, U387, U389, U394, U395, U404, and U409 through U411; 2) D003 other than those that are managed in a system whose discharge is regulated under Subtitle C, one that injects hazardous waste in a Class I injection well, or one that is a zero discharger that engages in federal CWA-equivalent treatment before ultimate land disposal; 3) Waste, soil and debris with the hazardous waste number K088; and 4) Radioactive waste, soil and debris with the hazardous waste numbers K088, K156 through K159, K161, P127, P128, P185, P188 through P192, P194, P196 through P199, P201 through P205, U271, U278 through U280, U364, U367, U372, U373, U387, U389, U394, U395, U404, and U409 through U41 only after having: 1) met the treatability standards of Part 728, Subpart D; or 2) been granted an exemption from prohibition pursuant to a petition under Section 728.106; 3) met the applicable treatment standards established pursuant to a petition granted under Section 728.144; or 4) been granted an extension to the effective date of prohibition pursuant to 40 CFR 268.5? Yes_____ No_____ N/A _X_	728.139
728.139(g)	Has the generator of the above wastes tested the waste or used knowledge of the waste to determine whether it exceeds the applicable treatment standards? Yes_____ No_____ N/A _X_	728.139(g)
	SUBPART E: PROHIBITIONS ON STORAGE **Note:** Except as provided in this section, the storage of hazardous wastes restricted from land disposal under Subpart C is prohibited.	

	Section 728.150 Prohibitions on Storage of Restricted Wastes	
728.150(a)(1)	Has the generator stored restricted wastes in tanks, containers, or containment buildings on-site solely for the accumulation of such quantities as necessary to facilitate proper recovery, treatment or disposal? Yes_____ No_X____ N/A_____ Has the generator complied with the requirements of Section 722.134? Yes_X____ No_____ N/A_____ **Note:** A generator in existence on the effective date of regulation under this Part and who must store hazardous wastes for more than 90 days due to regulations under this Part becomes a TSD and must obtain a RCRA permit.	728.150(a)(1)
728.150(a)(2)	Has the owner/operator of a TSD stored restricted wastes in tanks, containers, or containment buildings solely for the accumulation of such quantities of hazardous waste to facilitate proper recovery, treatment or disposal? Yes_____ No_____ N/A_X____ If yes, has the owner/operator: A) clearly marked each container to identify its contents and the accumulation start date? Yes_X____ No_____ N/A_____ B) clearly marked each tank to identify its contents, recorded the quantity of each hazardous waste received and indicated the accumulation start date, all in accordance with the operating record requirements of 724.173 or 725.173? Yes_X____ No_____ N/A_____	728.150(a)(2)
728.150(a)(3)	Has the transporter stored manifested shipments of such wastes at a transfer facility for 10 days or less? Yes_____ No_____ N/A_X____	728.150(a)(3)
728.150(b)	Has the owner/operator of a TSD stored restricted wastes up to one year solely for accumulation of such quantities of hazardous waste as necessary to facilitate proper recovery, treatment or disposal? Yes_____ No_____ N/A_X____	728.150(b)
728.150(c)	Has the owner/operator of a TSD who has stored such wastes beyond one year proved that such storage was solely for the accumulation of such quantities of hazardous waste to facilitate proper recovery, treatment or disposal? Yes_____ No_____ N/A_X____ **Note:** If a generator's waste is exempt from a prohibition on the type of land disposal utilized for the waste (e.g. case-by-case extension, incorporated by reference or an approved petition) the prohibition in subsection (a) does not apply during the period of such exemption. **Note:** The prohibition in subsection (a) does not apply to hazardous wastes that meet the treatment standards (728.141, 728.142 and 728.143) or the adjusted treatment standards (728.144) or, where treatment standards have not been specified, the waste is in compliance with the applicable prohibitions specified in Section 728.139.	728.150(c)
728.150(f)	Have liquid hazardous wastes containing PCBs at concentrations greater than 50 ppm been stored at a facility that meets the requirements of 40 CFR 261.65(b) and have they been removed from storage and treated or disposed as required by this Part within one year of the date when such wastes were first placed into storage? Yes_____ No_____ N/A_X____	728.150(f)
728.150(g)	Note: The prohibition and requirements in this Section do not apply to hazardous remediation wastes stored in a staging pile approved pursuant to Section 724.654.	

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R000055

0210600007 - Christian County
Taylorville/The Paint Shop
ILD982621690
FOS File

Attachment A

CHRISTIAN COUNTY SOLID WASTE MANAGEMENT DEPARTMENT

214 West Market Street
Taylorville, IL 62568

FAX TRANSMITTAL

Phone (217) 287-2334
FAX (217) 287-7755

TO: Steve Townsend

FAX #: (217) 786-6357

FROM: Joe Stepping

DATE: September 4, 2003

RECEIVED
SPRINGFIELD REGION
SEP 04 2003
ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

Number of page including cover: 24

MESSAGE: Since there are so many pages, some of which are poor quality, I'm going to mail you a copy of these also. Let me know if you need anything else.

1305R2029

TERRY [illegible]
CHRISTIAN CO. REC.

State $11.00 Co $5.50 Total $16.50

'95 APR 28 PM 3 19

FOR RECORDER'S USE

TAX ID: 17-13-32-400-006
WARRANTY DEED - STATUTORY FORM

Grantee: Evergreen Aviation, Inc.
Route 48 West
Taylorville, IL 62568

Tax Bill to: Evergreen Aviation, Inc.
Route 48 West
Taylorville, IL 62568

THE GRANTORS, MARY HENRIETTA BARNES, A WIDOW, NOT SINCE REMARRIED, LAURIE LYNN BARNES O'BRIEN, A MARRIED PERSON, JAMES MICHAEL BARNES, A DIVORCED PERSON NOT SINCE REMARRIED, SHARON LESLIE BARNES HAASIS, A MARRIED PERSON, DAVID BRUCE BARNES, A SINGLE PERSON AND CHRISTOPHER CULLEN BARNES, A MARRIED PERSON, being all of the heirs of Ronald D. Barnes, deceased, of the Cities of Taylorville, Springfield and Chanhassen, Counties of Christian, Sangamon and Carver and State of Illinois and Minnesota, respectively, for and in consideration of Ten and no/100-------------------------------- DOLLARS in hand paid, receipt of which is acknowledged, CONVEY and WARRANT to EVERGREEN AVIATION, INC., A DELAWARE CORPORATION, of the City of Taylorville, County of Christian and State of Illinois the following described Real Estate:

Lot 2 and the North Half of Lot 3 of Summer's Subdivision situated in a part of the Southeast Quarter of Section 32, Township 13 North, Range 2 West of the Third Principal Meridian, as shown on the Plat of Subdivision recorded with the Christian County Recorder in Plat Book 5 at page 318.

The grantors herein warrants that the property being conveyed does not constitute Homestead Property of grantors or their spouses.

STATE OF MINNESOTA)
) SS.
COUNTY OF ~~CARVER~~ Hennepin)

I, Julie A. Early, a Notary Public in and for the County and State aforesaid, DO HEREBY CERTIFY that CHRISTOPHER CULLEN BARNES, A MARRIED PERSON, heir of Ronald D. Barnes, deceased, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act, for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and notarial seal, this 24th day of April, 1995.

Julie A Early (SEAL)
Notary Public

My Commission Expires 1-31-2000

JULIE A. EARLY
NOTARY PUBLIC-MINNESOTA
HENNEPIN COUNTY
My Comm. Expires Jan. 31, 2000

STATE OF ILLINOIS)
) SS.
COUNTY OF SANGAMON)

I, Sandra L. Luzinski, a Notary Public in and for the County and State aforesaid, DO HEREBY CERTIFY that LAURIE LYNN BARNES O'BRIEN, A MARRIED PERSON, SHARON LESLIE BARNES HAASIS, A MARRIED PERSON, DAVID BRUCE BARNES, A SINGLE PERSON AND JAMES MICHAEL BARNES, A DIVORCED PERSON, NOT SINCE REMARRIED, heirs of Ronald D. Barnes, deceased, personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that they signed, sealed and delivered the said instrument as their free and voluntary act, for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and notarial seal, this 10th day of April, 1995.

Sandra L. Luzinski (SEAL)
Notary Public

My Commission Expires:

"OFFICIAL SEAL"
SANDRA L. LUZINSKI
NOTARY [illegible] STATE OF ILLINOIS
MY COMMISSION EXPIRES [illegible]

5562

1999R 05562
STATE OF ILLINOIS } SS No.
CHRISTIAN COUNTY }
Filed for record on the 26th day
of Aug A.D. 1999
3:30 o'clock P. M.
[signature]
Recorder

WARRANTY DEED

THE GRANTOR, Ruth Summer, also known as Ruth M. Summer, a widow, being the surviving spouse of a deceased husband and not remarried, of University City, Missouri, in consideration of the sum of ten and more dollars and other good and valuable consideration CONVEYS AND WARRANTS to

Evergreen Aviation, Inc., a Delaware Corporation

of having its principal offices in the City of Taylorville, Illinois, the following described real estate:

An undivided one half interest in and to:
The South Half (S 1/2) of Lot 3 and the North Half (N 1/2) of Lot 4 in Summer's Subdivision, a subdivision situated in the SE 1/4 of Section 32, T. 13 N., R. 2 West of the 3rd P. M., as shown by the Plat of subdivision recorded June 14, 1979 in Plat Book 5 page 318, in Christian County, Illinois,

hereby waiving and releasing all rights under and by virtue of the homestead exemption laws of the state of Illinois,
This conveyance is subject to coal and mineral rights heretofore reserved or conveyed way, to easements and restrictions, if any, relating to said premises, and to the general taxes for the years 1998 and 1999, payable in 1999 and 2000, which the grantee assumes and agrees to pay.
This deed is executed and delivered pursuant to and in exercise of the powers and authorities granted in the Power of Attorney dated April 19, 1991, recorded August 12, 1999 as Document No. 1999R5128, which power of attorney is in full force and effect.

Dated this 19 day of August, 1999.

Ruth Summer AKA Ruth M. Summer
by William L. Summer, Her Atty in Fact
_______________________(SEAL)
Ruth Summer, A/K/A Ruth M. Summer
By William L. Summer, Her Atty in Fact

State: $7.50 Co: $3.75 Total $11.25

State of California)
) SS
County of San Diego)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that William L. Summer, as the attorney in fact for Ruth Summer, also known as Ruth M. Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as the free and voluntary act and deed of his principal, Ruth Summer, also known as Ruth M. Summer, and as his free and voluntary act as attorney in fact, for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 19 day of August, 1999.

Notary Public

[illegible]
Commission # [illegible]
Notary Public - California
San Diego County
My Comm. Expires [illegible]

Prepared by
Hartzell Givens
Taylorville,
Illinois

Send tax statements to:
Evergreen Aviation, Inc.

Taylorville, Illinois

Tax I.D. No. 17-13-32-400-007

5563

1999R 05563

STATE OF ILLINOIS }
CHRISTIAN COUNTY } SS No. ___
Filed for record on the 26th day
of Aug A.D. 1999
3:30 o'clock P.M.
[signature]
Recorder

WARRANTY DEED

THE GRANTORS, Mark A. Summer, of the City of Taylorville, Illinois, Jay L. Summer, of Bay City, Michigan, Caryn Kay Summer, of the City of Chicago, Illinois, Cathy Ann Summer, of the City of Boulder, Colorado, all of said grantors being married persons, in consideration of the sum of Ten and more Dollars, and other good and valuable consideration CONVEY AND WARRANT to

Evergreen Aviation, Inc., a Delaware Corporation

having its principal offices in the City of Taylorville, Illinois, the following described real estate:
An undivided one half interest in and to:

The South Half (S 1/2) of Lot 3 and the North Half (N 1/2) of Lot 4 in Summer's Subdivision, a subdivision situated in the SE 1/4 of Section 32, T. 13 N., R. 2 West of the 3rd P. M., as shown by the Plat of subdivision recorded June 14, 1979 in Plat Book 5 page 318, in Christian County, Illinois,

This conveyance is subject to coal and mineral rights heretofore reserved or conveyed away, to easements and restrictions, if any, relating to said premises, and to the general taxes for the years 1998 and 1999 payable in 1999 and 2000, which the grantee assumes and agrees to pay.

The grantors, and each of them hereby certify that none of them nor their respective spouses reside on the above premises and no homestead rights are involved in this conveyance.

Dated this 19th day of May, 1999.

[signature] (SEAL) Mark A. Summer

[signature] (SEAL) Jay L. Summer

[signature] (SEAL) Caryn Kay Summer

[signature] (SEAL) Cathy Ann Summer

"OFFICIAL SEAL"
Anna D. Griffin
Notary Public, State of Illinois
My Commission Exp. 1?/?/2001

State of Illinois)
) SS
County of Christian)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Mark A. Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 18th day of August, 1999.

"OFFICIAL SEAL"

Brenda S. Spurling
Notary Public

State of Michigan)
) SS
County of Bay)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Jay L. Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 13th day of May, 1999.

Agatha Jankowiak
Notary Public

State of Illinois)
) SS
County of Cook)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Caryn Kay Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that she signed, sealed and delivered the said instrument as her free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 24th day of June, 1999.

Anna D. Griffin
Notary Public

"OFFICIAL SEAL"
Anna D. Griffin
Notary Public, State of Illinois
My Commission Exp. 11/10/2001

State of Illinois)
) SS
County of Christian)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Cathy Ann Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that she signed, sealed and delivered the said instrument as her free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 8 day of July, 1999.

Notary Public

Gretchen Lambrecht
My Commission Expires
June 30, 2001

Prepared by
Hartzell Givens
Taylorville,
Illinois

Send tax statements to:
Evergreen Aviation, Inc.

Taylorville, Illinois

Tax I.D. No.: 17-13-32-400-007-1

State: $7.50 Co: $3.75 Total $11.25

DEED

First Trust and Savings Bank of Taylorville, Illinois, Trustee,
under the provisions of a trust agreement dated the 1st day of April 1980,
and therein described and known as Trust Number 691, for and in consideration of the sum of
more than one hundred Dollars,
the receipt of which is hereby acknowledged by said Trustee, hereby Conveys and Warrants to Louis Brandis and Robert Brandis, Jr., of Springfield, Illinois,
all right title and interest in the following described real estate:

Lot One (1) of Summer's Subdivision situated in the County of Christian and State of Illinois;
EXCEPT coal and other minerals; and
SUBJECT to easements and restrictions of record.

In Witness Whereof, said Trustee has hereto affixed its hand and Seal this 12th day of August, 1980
(corporate seal)

ATTEST:
Cashier

First Trust and Savings Bank of Taylorville
By:
Vice President & Trust Officer

~~STATE OF ILLINOIS~~

~~COUNTY OF~~

~~, Trustee, under the provisions of a trust agreement dated the day of , 19 , and known as Trust Number , personally appeared before me this day, and known to me to be the same person whose name is subscribed to the foregoing instrument, and acknowledged that he executed the same for the purposes and uses therein set forth.~~

~~Given under my hand and Notarial Seal this day of 19~~

Notary Public

(1) "In Joint Tenancy and not as tenants in common" may be inserted.

STATE OF ILLINOIS :
:
COUNTY OF CHRISTIAN :

I, the undersigned, a notary public, in and for the county in the state aforesaid, Do Hereby Certify that [illegible], personally known to me to the Vice President and Trust Officer and [illegible] personally known to me to be the Cashier of First Trust and Savings Bank of Taylorville, Illinois, a banking corporation, whose names are subscribed to the foregoing instrument, appeared before me this day in person and severally acknowledged that as such Trust Officer and Cashier they signed and delivered the said instrument and caused the corporate seal of said bank to be affixed thereto, as their free and voluntary act, and as the free and voluntary act and deed of said First Trust and Savings Bank of Taylorville as Trustee under Trust Agreement dated April 1, 1980, and known as Trust Number 691, for the uses and purposes therein set forth.

Given under my hand and official seal, this [illegible] day of August, 1980.

Marilyn [illegible]
NOTARY PUBLIC

This Instrument Was Prepared By
[illegible]
Taylorville, Illinois [illegible]

STATE OF ILLINOIS } SS NO. 80 - 33276
CHRISTIAN COUNTY }
Filed for record on the 12 day
of Sept A.D. 1980
3:45 o'clock P.M.

[illegible]
Recorder

R000066

3272

1999R3272

CHRISTIAN CO. REC.

'99 MAY 24 PM 1 11

LICENSE AGREEMENT

BRANDIS AIRCRAFT

MAY 24, 1999

LICENSE AGREEMENT

This License Agreement is made and entered into and to be made effective as of January 1, 1996, by and between the City of Taylorville, Illinois, a municipal corporation, ("Owner") and Robert Brandis and John Brandis, individually and as partners of Brandis Aircraft, a partnership and Evergreen Aviation, Inc., a Delaware corporation doing business in Christian County, Illinois ("Licensee"), witnesseth:

WHEREAS, the Owner is the owner of the Taylorville Municipal Airport, Taylorville, Illinois; and

WHEREAS, the Licensee is doing business, on a tract of land which Licensee owns immediately adjacent to the Taylorville Municipal Airport which tract of land is legally described as follows:

> Lot 1, Lot 2 and the North Half of Lot 3 of Summer's Subdivision situated in a part of the Southeast Quarter of Section 32, Township 13 North, Range 2 West of the Third Principal Meridian, as shown on the Plat of Subdivision recorded with the Christian County Recorder in Plat Book 5 at page 318, situated in Christian County, Illinois,
>
> (herein referred to as Licensee's aforesaid property).

In consideration of the terms and provisions set forth herein, and other good and valuable consideration, the receipt, sufficiency, and adequacy of which is acknowledged, the parties mutually agree as follows:

(1) This License Agreement has been approved by the Federal Aviation Administration ("FAA") and the Illinois Department of Transportation, Division of Aeronautics ("IDOT").

(2) Owner hereby grants to Licensee, upon the terms hereinafter set forth, a license to: a) enter onto and exit from the Taylorville Municipal Airport solely from and to Licensee's aforesaid property and no other property at the licensed entrance and exit point hereinafter described in paragraph (4) of this License Agreement; and b) to use for the sole purpose of an aircraft parking ramp area incident to Licensee's aircraft repair business activities a 25' x 242' area of Owner's land, such area being referred to herein as "parking ramp area" and is described as commencing from the NE corner of the existing paved area of the access taxiway (shown on Exhibit 1), thence southerly 34' for the place of beginning. From said place of beginning, thence South 242' along Owner's easterly property boundary line to a point, thence westerly 25' to a point, thence northerly 242' along a line parallel to Owner's easterly property boundary line to the South side of the existing paved area of the access taxiway, thence easterly along the South edge of the existing paved area of the access taxiway to the point of beginning. Licensee, at its sole expense, shall keep the grassy area within the parking ramp area trimmed and mowed to a height not to exceed 6 inches and otherwise maintain the

grassy area now situated within the parking ramp area. Licensee shall not pave or otherwise alter the existing sod and grassy area within the parking ramp area and shall not build nor maintain any permanent or temporary structure within the parking ramp area. The intent is to allow Licensee to only place wheels of parked aircraft on the existing pavement located within the parking ramp area now encroaching upon Owner's property and allow for such parked aircraft's appurtenances to extend above but without touching the non-paved parking ramp area. Such license shall be for an initial term of ten years commencing January 1, 1996 to December 31, 2005; and this License Agreement, subject to earlier termination as provided in this License Agreement, shall be automatically renewed for successive one year periods until and unless Owner or Licensee shall give written notice to the other at least thirty (30) days prior to the expiration of the initial term or any successive annual term of this License Agreement of such party's intention not to renew this License Agreement. This License Agreement only applies to Licensee's aforesaid property and does not apply to any adjacent or other property now owned or leased or used by or hereafter owned or leased or used by Licensee or any other person, firm or entity.

(3) Licensee shall pay to Owner, as compensation for the privileges being granted by the issuance of such license, an annual fee which shall be based upon an amount per square foot of building and/or structure space (covered and/or enclosed) situated from time to time upon Licensee's property and upon the square feet area of the parking ramp area. Such annual fee for the year January 1, 1996 to December 31, 1996 shall be $2,992.80; which amount is based on $.12 per square foot of Licensee's existing building space of 18,890 square feet and of the leased ramp area of 6,050 square feet for a total of 24,940 square feet. The annual fee to be paid in subsequent years during the initial term or any renewal term of this license shall be paid on January 1 of each such year; and the amount of such annual fee (i.e. the price per square foot times Licensee's then total existing building and/or structure space (covered and/or enclosed) on Licensee's aforesaid property and the parking ramp area) shall be as determined by the Owner in its sole discretion, provided, however, such annual fee shall not be increased more than the greater of the following percentages: a) The most current cost of living percentage increase over the cost of living Index for August, 1996 as determined by the U.S. Department of Labor, Bureau of Labor Statistics, CPI Detailed Report for the Consumer Price Index For URBAN Wage Earners and Clerical Workers Selected Areas All Items Index for St. Louis, Missouri (currently Table 17 thereof); or b) The average total percentage rental increase since January 1, 1996 applicable to the Owner's T-Hangar leases for tenants located on Taylorville Municipal Airport. A termination by Owner for violation of this License Agreement shall result in a forfeiture of the remaining balance of the annual fee paid. The annual fee for each of the years 1996, 1997, 1998 and 1999 shall be paid on or before June 18, 1999.

(4) The licensed entrance and exit point shall be limited to the location as shown on Exhibit 1, attached hereto and incorporated by reference thereto, which point is the location where the Owner's existing 34' wide access taxiway paved surface (projecting eastward from the extreme south end of the Owner's existing north-south taxiway) meets with the west boundary line of the Licensee's aforesaid property. The licensed

entrance and exit point is described as a line 50 feet northerly and 50 feet southerly of the center point of the existing paved area of the easterly boundary of said access taxiway. The licensed entrance and exit point may be used only by the Licensee and its customers for the sole purpose directly associated with Licensee's aircraft repair, refurbishment, modification and painting business conducted on Licensee's aforesaid property; and may not be used as a "pass-through" point for any other persons or personal activity or any other business activity.

(5) Licensee shall, on or before June 18, 1999, install and thereafter maintain, at Licensee's sole cost and expense, the fences specified herein and a bar type gate at the locations described herein and generally shown on Exhibit 1, which gate shall remain locked at all times except during specific times when vehicles or personnel are actually entering or exiting and passing through the bar gate area. Licensee shall also within said time, provide, erect, and thereafter maintain two signs of a dimension of 3 feet high by 5 feet wide each. Such signs shall be prominently placed and maintained facing each side (Airport side and Licensee side) and located adjacent to the midpoint of said access taxiway. The signs shall be located on the north and south sides of Owner's existing access taxiway paved surface adjacent to the licensed entrance and exit point and 40 feet from the center line thereof. The signs facing westerly (airport side) shall state in bold lettering (at least 4 inches high), as follows: **"PRIVATE PROPERTY – FOR THE USE OF BRANDIS AIRCRAFT AND ITS CUSTOMERS"**. The signs facing easterly (Licensee side) shall state in bold lettering (at least 4 inches high), as follows: **"AIRPORT AUTHORIZED PERSONS ONLY"**. In addition, Licensee shall also, within said time, provide, install, and thereafter maintain a sign of a dimension of at least 3 feet high by 5 feet wide which shall be located on said bar gate and facing easterly. Such sign facing easterly shall state in bold lettering (at least 4 inches high), as follows: **"AIRPORT OR BRANDIS AIRCRAFT AUTHORIZED PERSONS ONLY"**. At Licensee's expense, such bar gate together with at least 4 foot high fences shall be installed and maintained at the locations as are shown for the bar gate and said fences on the aforesaid attached Exhibit 1 and hereinafter described.

Fence No. 1 shown on Exhibit 1 shall commence from the SW corner of Licensee's building (described as "New Bldg. #2301 South Spresser" on Exhibit 1), then continue southerly to Licensee's southerly property boundary line, then continue westerly to a point located one foot westerly of the Owner's easterly property boundary line, then continue and connect with Owner's existing fence located to the south of such point. Fence No. 2 shown on Exhibit 1 shall commence from the NW corner of Licensee's building (described as "Warehouse" #2201 South Spresser on Exhibit 1) and continue westerly to connect with the Owner's existing fence now located westerly from such building and north of the access taxiway. Fence No. 3 shown on Exhibit 1 shall connect to and run between the north side of Licensee's New Bldg. #2301 South Spresser and the south side of Licensee's Hanger #2207 South Spresser. Fence No. 4 shown on Exhibit 1 shall commence from the NW corner of Licensee's Hanger #2207 South Spresser and continue northerly to the bar gate to be installed by Licensee and continue northerly from said bar gate and connect to the south side of Licensee's Warehouse #2201 South Spresser. Licensee may install a personnel gate within Fence

No. 3 provided however such gate must remain locked at all times except during specific times person or persons are actually passing through said gate. Fences Nos. 1 and 2 shall be at least 4 feet high from the ground level and shall consist of chain link fencing. Fences No. 3 and 4 shall be at least 4 feet high from the ground and may consist of ornamental fencing (eg. wrought iron) at least as stable and secure as chain link fencing. Notwithstanding anything herein to the contrary, in the event the City hereafter elects to fence in an area of the City's Airport property which fence becomes located adjacent to or within 100 feet of the nearest point of Licensee's aforesaid property or the City is required to do so by the Federal Aviation Administration ("FAA") and/or by the Illinois Department of Transportation Division of Aeronautics ("IDOT") or any other governmental entity or agency which has jurisdiction over the City's Airport property, then Licensee shall, within 30 days Notice from the City to do so, relocate and install, at Licensee's expense, the aforesaid bar type gate and signs along and between the property boundary line of Licensee's aforesaid property and the Owner's property line at the aforesaid entrance and exit area shown on said Exhibit 1.

During the initial term and any renewal term of this License Agreement, Licensee shall not allow any access to or from the Taylorville Municipal Airport other than from and through the aforesaid location of said bar gate.

(6) No aircraft may be moved from the Licensee's aforesaid property to the Taylorville Municipal Airport or from the Taylorville Municipal Airport to Licensee's premises except as taxied by a licensed pilot or A & P qualified mechanic; or, towed by a person qualified to do so.

(7) The Taylorville Municipal Airport is a non-controlled airport which has no control tower. Licensee, in utilizing this license, shall be and remain responsible and accountable for compliance with all local, state, and federal safety operational requirements imposed on all aircraft using or utilizing such an airport.

(8) Licensee shall not conduct any aircraft business related activity or service on Licensee's aforesaid property which may be in direct competition with any aircraft business related activity provided or afforded on or by the Taylorville Municipal Airport or its Fixed Base Operator (FBO), e.g. FBO services such as fuel sales, providing fuel, flight instruction, etc., etc. Licensee shall be permitted, but limited to, performing aircraft repair, refurbishment, modification, and painting.

(9) Licensee shall comply with and is subject to all the Rules and Regulations of the Taylorville Municipal Airport and all federal, state and local statutes, laws, ordinances, rules, and regulations as now in existence or as may be hereafter adopted, modified, or amended, the same being incorporated herein by reference.

(10) Upon Licensee's initial failure to comply with any one or more violations of any term(s) or provision(s) of this Agreement, Owner may issue a 15-day Notice to Remedy to Licensee. If Licensee fails to comply with said Notice, then Owner may terminate this License Agreement upon a 15-day Notice of Termination to Licensee.

Owner need not issue a Notice of Remedy for the second or any subsequent violations of the same term(s) or provision(s) during any time this License Agreement remains in effect; and the Owner need not issue a Notice of Remedy for the fourth or any subsequent violation of any term(s) or provision(s) which occur during any calendar year of this License Agreement, regardless of whether or not said fourth or subsequent violation is the same violation as any of the previous violations. In such event, the Owner may immediately issue said 15-day Notice of Termination to Licensee. In the event this License Agreement and License is terminated, the rights and remedies of Owner as set forth in this paragraph (10) shall remain in effect. Upon such termination, Owner, without further notice, may lock or bar the aforesaid gate if it is then located along and between the Licensee's aforesaid property line and the Owner's property line at said entrance and exit area as shown on the aforesaid Exhibit 1; or if said gate is not then located at such area, the City may install and maintain a gate at such entrance and exit area and lock said gate and keep said gate locked. If this License Agreement is terminated, Licensee shall immediately cease any further exercise of the license granted. If Licensee shall fail to do so, the Owner may take or seek whatever legal and/or equitable remedies it may deem appropriate, including, but not limited to, all civil and criminal trespass, self-help, and injunctive relief. In addition to and not exclusive of Owner's aforesaid remedies, either party, upon default of the other party, shall be entitled to take any and all available legal and/or equitable remedies, including, but not limited to, compelling specific performance or obtaining injunctive relief. The defaulting party shall pay the non-defaulting party's reasonable attorney fees and costs. For purposes hereof or for any other notice to Licensee, notice shall be deemed delivered when either personally served upon an officer, employee, or agent of Licensee or on the 2nd day after mailing such notice by certified mail to Licensee at the following address:

Brandis Aircraft
2207 S. Spresser
Taylorville, IL 62568

If notice is so mailed by certified mail, service of such notice shall be deemed made on the 2nd day after mailing such notice to Licensee at the aforesaid address, regardless if Licensee actually signs a receipt for such notice.

(11) Neither this License Agreement or the aforesaid License, nor any right hereunder, may be sold, assigned, or transferred in whole or in part by Licensee. Any attempt to do so shall be deemed to effect an immediate termination of this License Agreement and said license. This License Agreement and license shall also terminate upon conveyance, by Licensee, of all or any part of its ownership interest in Licensee's aforesaid property, (excluding a mortgage for loan or collateral purposes).

(12) The Licensee shall comply with and conform in all respects to the requirements of any existing or proposed federal or state grant agreement of which Owner is a party.

(13) Licensee hereby vacates and releases its "perpetual easements for ingress and egress from each lot described in the final plat of Summer's Subdivision to the airport runway" all as more fully described in a certain Agreement made January 22, 1979 between Morris Summer and Ruth Summer, as First Parties, and the City of Taylorville, as Second Party; and City and Licensee hereby agree that said perpetual easements for ingress and egress are hereby terminated and of no further force and effect; but the Owner's avigation easement referred to in said Agreement shall continue to remain in full force and effect; and that a signed copy of this License Agreement may be recorded with the Recorder's Office for Christian County, Illinois to evidence such vacation, termination, and release of Licensee's aforesaid easements for ingress and egress to the airport runway.

IN WITNESS WHEREOF, the parties hereto have signed this License Agreement, in triplicate.

Dated: 5/21/99

LICENSEE:

Robert Brandis, individually

John Brandis, individually

BRANDIS AIRCRAFT

By: Robert Brandis, Partner

By: John Brandis, Partner

OWNER:

CITY OF TAYLORVILLE, ILLINOIS, a Municipal Corporation

By: Jim Montgomery, Jr., Mayor

Attest:

By: Pamela J. Peabody, City Clerk

(Municipal Seal)

EVERGREEN AVIATION, INC., a
Delaware Corporation

By: ____________________
Its President

Attest:

By: John Brandis
Its Secretary

(corporate seal)

STATE OF ILLINOIS)
) SS.
COUNTY OF Christian)

I, a Notary Public, in and for said County, in the State aforesaid, do hereby certify that Robert Brandis, individually, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed and delivered the said instrument as his free and voluntary act, for the uses and purposes therein set forth.

Given under my hand and notarial seal this 21st day of May, 1999.

OFFICIAL SEAL
JOANN MICHELLE BINEGAR
NOTARY PUBLIC STATE OF ILLINOIS
MY COMMISSION EXP. NOV 27, 1999

Joann Michelle Binegar
Notary Public

STATE OF ILLINOIS)
) SS.
COUNTY OF Christian)

I, a Notary Public, in and for said County, in the State aforesaid, do hereby certify that John Brandis, individually, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed and delivered the said instrument as his free and voluntary act, for the uses and purposes therein set forth.

Given under my hand and notarial seal this 21st day of May, 1999.

OFFICIAL SEAL
JOANN MICHELLE BINEGAR
NOTARY PUBLIC STATE OF ILLINOIS
MY COMMISSION EXP. NOV 27, 1999

Joann Michelle Binegar
Notary Public

STATE OF ILLINOIS)
) SS.
COUNTY OF Christian)

I, a Notary Public, in and for said County, in the State aforesaid, do hereby certify that Robert Brandis and John Brandis, personally known to me to be the partners of Brandis Aircraft, the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that they signed and delivered the said instrument as their free and voluntary act, for the uses and purposes therein set forth.

Given under my hand and notarial seal this 21st day of May, 1999.

OFFICIAL SEAL
JOANN MICHELLE BINEGAR
NOTARY PUBLIC STATE OF ILLINOIS
MY COMMISSION EXP. NOV 27, 1999

Joann Michelle Binegar
Notary Public

STATE OF ILLINOIS)
) SS.
COUNTY OF Christian)

I, a Notary Public, in and for said County, in the State aforesaid, do hereby certify that Mike Brandis, personally known to me to be the President of the Evergreen Aviation, Inc. corporation, and John Brandis, personally known to me to be the Secretary of said corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and severally acknowledged that as such President and Secretary, they signed and delivered the said instrument as President and Secretary of said corporation, and caused the corporate seal of said corporation to be affixed thereto, pursuant to authority given by the Board of Directors of said corporation as their free and voluntary act, and as the free and voluntary act and deed of said corporation, for the uses and purposes therein set forth.

Given under my hand an notarial seal this 21st day of May, 1999.

OFFICIAL SEAL
JOANN MICHELLE BINEGAR
NOTARY PUBLIC STATE OF ILLINOIS
MY COMMISSION EXP. NOV 27, 1999

Joann Michelle Binegar
Notary Public

STATE OF ILLINOIS)
) SS.
COUNTY OF CHRISTIAN)

I, the undersigned, a Notary Public, in and for said County, in the State aforesaid, do hereby certify that **JIM MONTGOMERY, JR.**, personally known to me to be the Mayor of the City of Taylorville, a municipal corporation, and **PAMELA J. PEABODY**, personally known to me to be the City Clerk of the City of Taylorville, a municipal corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and severally acknowledged that as such Mayor and

City Clerk they signed and delivered the said instrument as Mayor and City Clerk of said City of Taylorville, a municipal corporation, and caused the corporate seal of said corporation to be affixed thereto, pursuant to authority, given by the City Council of said corporation as their free and voluntary act, and as the free and voluntary act and deed of said corporation, for the uses and purposes therein set forth.

Given under my hand and Notarial Seal this 24th day of May, 1999.

"OFFICIAL SEAL"
LINDA A. WOODWARD
NOTARY PUBLIC
STATE OF ILLINOIS
MY COMMISSION EXPIRES 4-23-2001

Linda A. Woodward
Notary Public

Together with all easements and appurtenances in favor of said above described property.

Except all coal, minerals and mining rights heretofore conveyed of record.

Subject to taxes for the year 1994 and subsequent years.

Subject to easements, restrictions and reservations of record, if any.

Situated in the City of Taylorville in the County of Christian, in the State of Illinois, hereby releasing and waiving all right under and by virtue of the Homestead Exemption Laws of this State.

Dated this 12 day of April, A.D., 1995.

Mary Henrietta Barnes (SEAL)
MARY HENRIETTA BARNES

Laurie Barnes O'Brien (SEAL)
LAURIE BARNES O'BRIEN

Sharon Leslie Barnes Haasis (SEAL)
SHARON LESLIE BARNES HAASIS

David Bruce Barnes (SEAL)
DAVID BRUCE BARNES

James Michael Barnes (SEAL)
JAMES MICHAEL BARNES

Christopher Cullen Barnes (SEAL)
CHRISTOPHER CULLEN BARNES

STATE OF ILLINOIS)
) SS.
COUNTY OF CHRISTIAN)

I, Jennifer L. Estes, a Notary Public in and for the County and State aforesaid, DO HEREBY CERTIFY that MARY HENRIETTA BARNES, A WIDOW, NOT SINCE REMARRIED, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that she signed, sealed and delivered the said instrument as her free and voluntary act, for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and notarial seal, this 28 day of April, 1995.

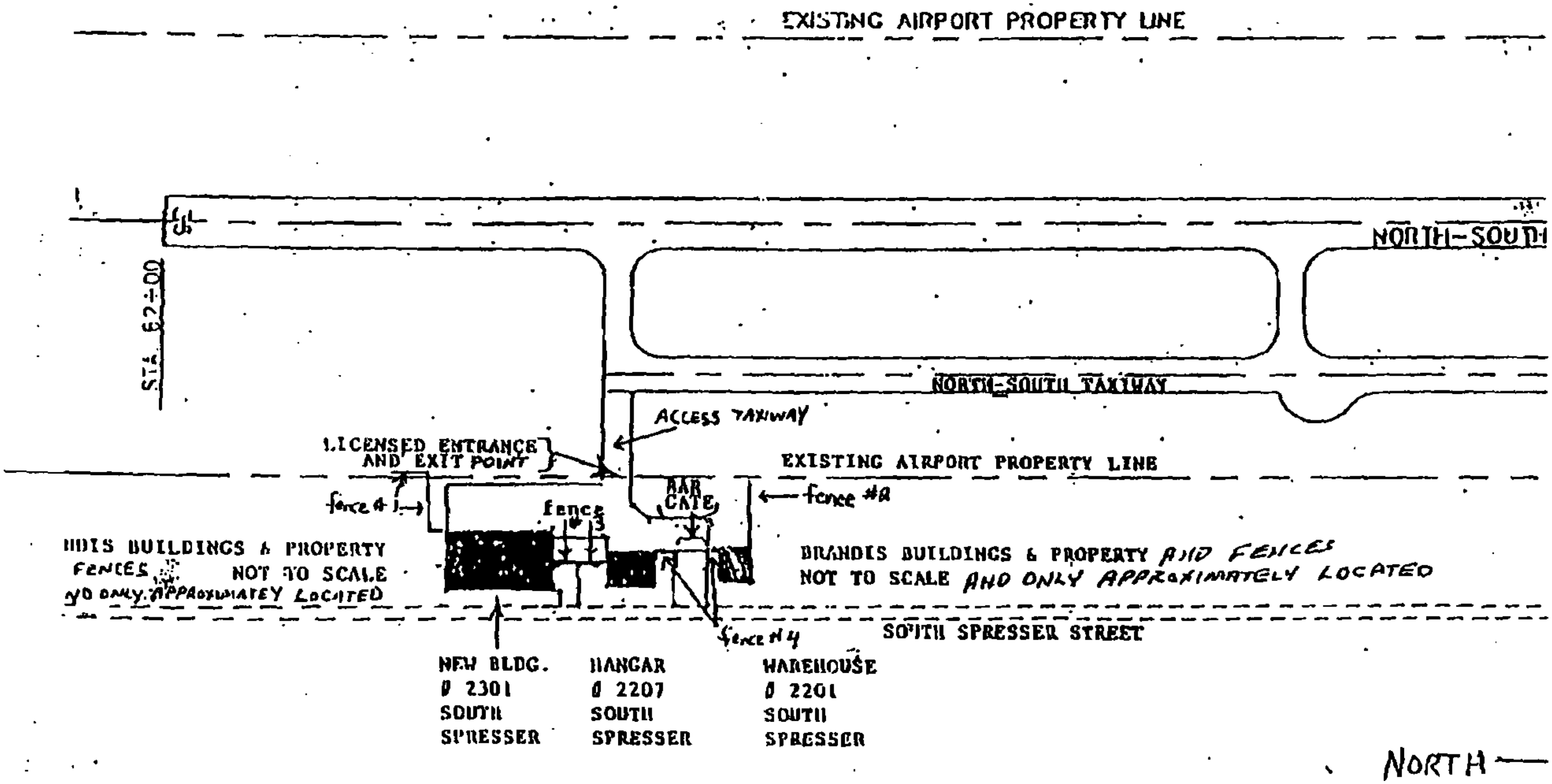
Jennifer L Estes (SEAL)
Notary Public

My Commission Expires 9-25-98

Prepared By:
Presney, Kelly & Presney
726 South Second Street
Springfield, IL 62704 (217) 525-0016

Return To:
Taylorville Title Co.
301 South Webster
P.O. Box 341
Taylorville, IL 62568

"OFFICIAL SEAL"
Jennifer L. Estes
NOTARY PUBLIC
STATE OF ILLINOIS
MY COMMISSION EXPIRES 9-25-98



EXISTING AIRPORT PROPERTY LINE
NORTH-SOUTH
STA. 62+00
NORTH-SOUTH TAXIWAY
ACCESS TAXIWAY
LICENSED ENTRANCE AND EXIT POINT
EXISTING AIRPORT PROPERTY LINE
fence #1
fence 3
BAR GATE
fence #2
fence #4
BRANDIS BUILDINGS & PROPERTY NOT TO SCALE
FENCES NOT TO SCALE AND ONLY APPROXIMATELY LOCATED
BRANDIS BUILDINGS & PROPERTY AND FENCES NOT TO SCALE AND ONLY APPROXIMATELY LOCATED
SOUTH SPRESSER STREET
NEW BLDG. @ 2301 SOUTH SPRESSER
HANGAR @ 2207 SOUTH SPRESSER
WAREHOUSE @ 2201 SOUTH SPRESSER
NORTH

EXHIBIT 1

R000079

U.S. Environmental Protection Agency

Resource Conservation and Recovery Act (RCRAInfo)

0210600007 - Christian County
Taylorville / The Paint Shop
ILD982621690
FOS File

Attachment B

Recent Additions | Contact Us

EPA Home > Envirofacts > RC

Query Results

RCRAInfo

Consolidated facility information (from multiple EPA systems) was searched to select facilities

Handler ID: Containing: ILD982621690

Results are based on data extracted on AUG-09-2003
Note: Click on the underlined CORPORATE LINK value for links to that company's environmental web pages.
Click on the underlined MAPPING INFO value to obtain mapping information for the facility.

Go To Bottom Of The Page

HANDLER NAME:	BRANDIS AIRCRAFT	HANDLER ID:	ILD982621690
STREET:	ROUTE 48 WEST	FACILITY INFORMATION:	View Facility Information
CITY:	TAYLORVILLE	CORPORATE LINK:	No
STATE:	IL	COUNTY:	CHRISTIAN
ZIP CODE:	62568	MAPPING INFO:	MAP
EPA REGION:	5		

Contact Information

There is no Core, Notification or BRS contact information available for this handler

No NAICS Codes are available for the facility listed above.

Go To Top Of The Page

Total Number of Facilities Displayed: 1

021060007 - Christian County
Taylorville / The Paint Shop
ILD982621690

R000080

U.S. Environmental Protection Agency

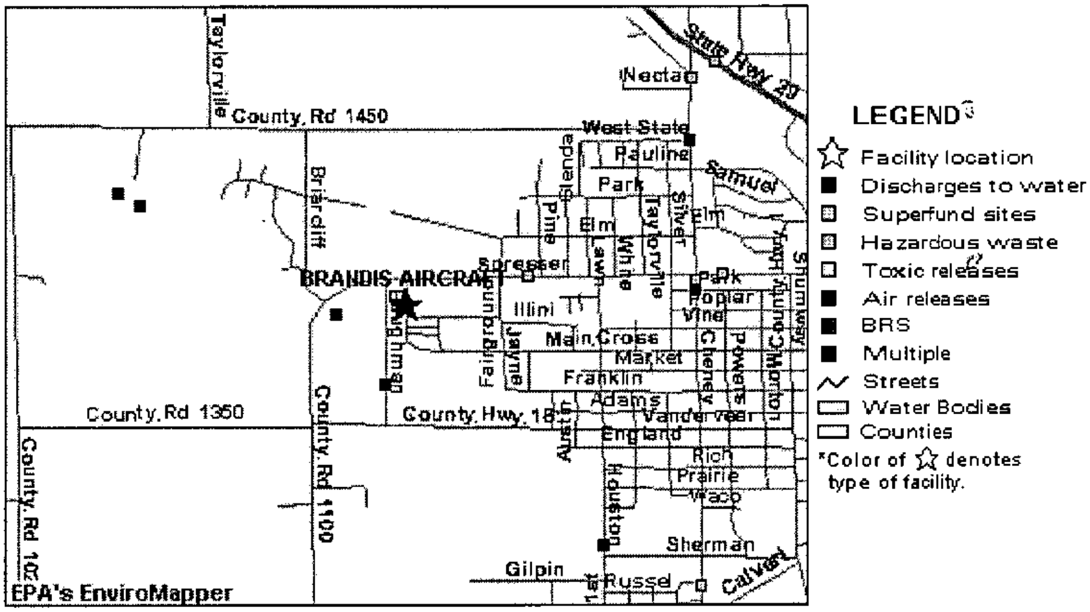
Locational Reference Tables (LRT)

Facility Location Information

Locational Information

Report an Error

BRANDIS AIRCRAFT
ROUTE 48 WEST
TAYLORVILLE IL 62568
Latitude: 39.55156 Longitude: -89.320808



The latitude and longitude coordinates above come from the Envirofacts Locational Reference Tables (LRT). The method used to derive the Most Accurate Coordinates was ZIP CODE-CENTROID. These coordinates correspond to a reference point documented as 'OTHER' and represent the best location for the facility. The coordinates were obtained from CONTRACTOR.

Query executed on AUG-29-2003

0210600007 - Christian County
Taylorville/The Paint Shop
ILD982621690
FOS File
Attachment C

R000001

BUREAU OF LAND INVENTORY DATA INPUT FORM

INVENTORY # ISSUED: 0 2 1 0 6 0 0 0 0 7 (1–10)

TRAN CODE — A dd ☐ / C hange ☒ — 14 (CHECK)

TRAN DATE / / — 15 (LEAVE BLANK)

010 FACILITY NAME (11 13)
T H E P A I N T S H O P (24)

USEPA#: I L D 9 8 2 6 2 1 6 9 0 (66–77) **NAICS CODE:** (94 99 100)

IEMA INCIDENT #:

020 LOCATION ADDRESS (STREET ADDRESS REQUIRED) — SEND MAIL H
11 13
STREET: 2 2 0 7 S . S P R E S S E R (24)
P. O. BOX: (49 54)
CITY: T A Y L O R V I L L E (55–74) **STATE:** I L (75 76)
ZIP: 6 2 5 6 8 - (77–85) **TELEPHONE:** 2 1 7 - 8 2 4 - 8 0 3 2 (86 89 92 95)
CONTACT: R O B E R T B R A N D I S (96–120) **MAIL IND:** (121)
COUNTY: C H R I S T I A N **TOWNSHIP:**

030 OWNER ADDRESS (IF SAME AS ABOVE, LEAVE BLANK): — SEND MAIL HERE ☒
11 13
NAME: S u m m e r T r u s t * (24–53)
STREET: 2 3 0 1 S . S P R E S S E R (54–78)
P.O. BOX: (79 84) **CITY:** T A Y L O R V I L L E (85–104)
STATE: I L (105 106) **ZIP:** 6 2 5 6 8 - (107–115) **TELEPHONE:** 2 1 7 - 8 2 4 - 8 0 3 2 (116 119 122 125)
CONTACT: R O B E R T B R A N D I S (126–150) **MAIL IND:** (151)

040 OPERATOR ADDRESS (IF SAME AS ABOVE, LEAVE BLANK): — SEND MAIL HERE ☒
11 13
NAME: T H E P A I N T S H O P (24–53)
STREET: 2 3 0 1 S . S P R E S S E R (54–78)
P.O. BOX: (79 84) **CITY:** T A Y L O R V I L L E (85–104)
STATE: I L (105 106) **ZIP:** 6 2 5 6 8 - (107–115) **TELEPHONE:** 2 1 7 - 8 2 4 - 8 0 3 2 (116 119 122 125)
CONTACT: R O B E R T B R A N D I S (126–150) **MAIL IND:** (151)

Indicate source of information: ☒ Site Inspection ☐ Company Letter ☐ Annual Report ☐ Other: County Record ☐ LUST Report

SEND E-MAIL TO: bolid.request@epa.state.il.us

FROM: STEVE TOWNSEND **REG/SECTION:** Springfield

* Site operator provided this information. Not yet able to confirm via county records

TELEPHONE #: 2 1 7 - 7 8 6 - 6 8 9 2 **DATE:** 9/15/2003

PREVIOUS COMPANY NAME: Brandis Aircraft

AGENCY SITE ID NUMBER: 1 7 Check box to send form by e-mail. ☒

brandis 2178248033 P. 2

STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY DIVISION OF LAND POLLUTION CONTROL
P.O. BOX 19276 SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761
State Form LPC 62 8/81 IL532-0610

R000082

FOR SHIPMENT OF HAZARDOUS AND SPECIAL WASTE

PLEASE TYPE (Form designed for use on elite (12 pitch) typewriter.) EPA Form 8700-22 (Rev. 6-89) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: ILD982621690
Manifest Document No.: 64633
2. Page 1 of 1
Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address — Location If Different
[illegible] AVIATION
[illegible] 48 WEST, TAYLORVILLE, ILLINOIS 62568

4. "24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS" 217-824-8032

A. Illinois Manifest Document Number: IL 10264633 FEE PAID IF APPLICABLE
B. Generator's IL ID Number: 0210600007

5. Transporter 1 Company Name: [illegible] CHEMICAL, INC.
6. US EPA ID Number: ILD060868916
C. Transporter's ID Number: UPM-378614-IL
D. Transporter's Phone: (309) 674-6144

7. Transporter 2 Company Name:
8. US EPA ID Number:
E. Transporter's ID Number:
F. Transporter's Phone: ( )

9. Designated Facility Name and Site Address
POLLUTION CONTROL INDUSTRIES
[illegible] AVENUE
[illegible] CHICAGO, IN. 46312
10. US EPA ID Number: IND000646943
G. Facility's IL ID Number:
H. Facility's Phone: (219) 397-3951

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. [illegible] WASTE FORMIC ACID SOLUTION, [illegible], UN 1779, PG II (D002)	ERG #2153	0.0.2	DM	[illegible]	G	D002
b. [illegible] WASTE FLAMMABLE LIQUID, N.O.S. ([illegible] SPIRITS, TOLUENE) [illegible] 1993, PG II (D001)	ERG 128	0.0.4	DM	[illegible]115	G	D001
c.						
d.						

J. Additional Description for Materials Listed Above
a) STREAM # 248936 (F002)
b) STREAM # 248937

K. Handling Codes for Wastes Listed Above in Item #14

15. Special Handling Instructions and Additional Information
24 HOUR EMERGENCY PHONE: INFOTRAC 800-535-5053

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: [illegible] Signature: [illegible] Date Month Day Year: [illegible]

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [illegible] Date Month Day Year: 09/03/93

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: Signature: Date Month Day Year:

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered [...]
Printed/Typed Name: Signature:

0210600007- Christian County
Taylorville/The Paint Shop
ILD982621690
FOS File

Attachment D

This Agency is authorized to require, pursuant to Illinois Revised Statute, 1989, Chapter 111 1/2, S[...] information may result in a civil penalty against the owner or operator not to exceed $25,000 per day of [...] imprisonment up to 5 years. This form has been approved by the Forms Management Center.

COPY 5, GENERATO[R] (RCRA HAZARDOUS AND [...]

In case of a spill call the Illinois Office of Emergency Response at 217 / 782-7860 and the National Response Center at 800 / 424-8802 or 202 / 426-2675.

Christian County
Taylorville / The Paint Shop
ILD982621690
FOS File

2178248033

R000083 P. 1

Attachment E

9/4/03

RECEIVED
SPRINGFIELD REGION
8:40 AM
SEP 04 2003
ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

ATTN:

Steve Townsend

Ref: Paint Shop Info / Taylorville IL

Here are documents as Requested. Our H_2O as we pick it up, Before Treatment, averages 4.2 – 4.4 PH; After Treatment 7.0 – 7.8. Taylorville H_2O at the plant is 9.8, at the faucet it is about 7.0 – 7.3. Sp.! H_2O is 9.0 at plant, 7.8 to 8.2 at faucet.

Pages for MSDA on stripper + chemicals used to clean + Reuse our H_2O for wetting floor, dust control, parts Rinse, etc.

Manifest for last waste pickup. Next is scheduled for today or tomorrow by Coleman Chem of Peoria. We are also going to have our oil waste removed at this time to clean up all products as discussed with you.

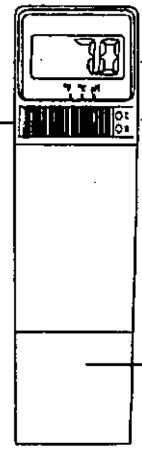
Pictures of holding tank setup (as you suggested) will be sent next week.

Sincerely
R Brandis

(* waste drums have been labeled.) Product + Empty drums we use as parts racks are not.

OMEGA®
An OMEGA Technologies Company

PHH-3X
Pocket pH Tester
M1661/0693



GENERAL DESCRIPTION

The PHH-3X pocket-size pH tester combines pH electrode, temperature sensor and readout into a single, compact unit. The electrode module contains a signal amplifier and a temperature sensor to let you take temperature compensated readings. The electrode module is easily replaced, thus extending the life of this handy pocket tester. The electrode module detaches for easy replacement or battery removal.

The unit can be immersed up to 4" without damage. The PHH-3X has two-point calibration for both temperature and pH scales.

BEFORE FIRST USE

Condition the unit before its first use. Remove the protective cap and immerse the electrode in tap water for 30 minutes to 1 hour to hydrate the electrode and dissolve any crystals formed. **CAUTION: Never immerse the tester above the yellow plug-in electrode.**

PH CALIBRATION

pH calibration is required to maintain instrument accuracy. Calibration should be performed on a regular basis; however, frequency of calibration is application dependent.

1. Turn on power switch at the right side of the unit and set the range switch to the pH position. Remove end cap and place tester in a container of pH 7.0 buffer solution. Stir gently and wait a few seconds.
2. After the reading has stabilized, adjust (S) trimmer with a small screwdriver to a reading of 7.0.
3. Place the tester in a container of pH 4 or 10 buffer solution and adjust (Z) trimmer for a reading of 4.0 or 10.0.
4. Repeat above steps as required.

TEMPERATURE CALIBRATION

1. Remove end cap and place tester in a container of ice water and allow the reading to stabilize. Stir gently and wait a few seconds.
2. Set range switch to degrees F and adjust (Z) trimmer for a reading of 32.
3. Place the tester in a container of water at a higher temperature which is known and allow the reading to stabilize. Adjust (S) trimmer for the known temperature on the display.
4. Repeat above steps as required.

OPERATING PROCEDURE

After calibration, sample measurements can be performed.

1. Dip tester in solution up to 1 inch level. **Under no circumstances immerse above the top of the yellow electrode.**
2. Stir gently and wait a few seconds.
3. When not in use, switch off the tester. To ensure optimum operation, electrode should be kept moist. If soaker pad in bottom of protective cap is dry, pour buffer 4.0 or 7.0 into cap to remoisten pad. Should pad be missing, simply add pH 4.0 or 7.0 buffer to cap and replace.

MAINTENANCE IS EASY!

Rinsing the electrode with distilled or deionized water between samples and after use will prevent cross contamination and help extend useful life. When using aggressive solutions, or solutions with heavy metals or proteins, take readings quickly and rinse electrode immediately afterwards with deionized water to remove any residue. This helps eliminate any possible contamination of the electrode. Maintaining the protective cap soaker pad by moisting with pH 4.0 or 7.0 buffer will help maximize electrode life. When electrode will no longer calibrate or pH reading stays at a fixed value, replace electrode module. pH electrode life is typically 6 months to 1 year depending on the application.

CHANGING BATTERIES

Remove yellow plug-in electrode while pressing yellow lock above pocket clip. Replace old batteries with fresh ones, noting polarity as shown in the battery compartment. **Note:** No battery connector wires to break!

SPECIFICATIONS

pH

Range: 0.0 to 14.0 pH
Resolution: ±0.1 pH
Accuracy: ±0.1 pH ATC

TEMPERATURE

Range: 32 to 158°F (0 to 70°C)
Resolution: ±1°C or F
Accuracy: ±1°C or F

GENERAL

Display: 2 1/2 digit 0.5" high LCD
Battery: Three 1.35 V (included)
Battery Life: 200 hr continuous
Dimensions: 6" H x 1.7" W x 0.9" D (162 x 43 x 23 mm)
Weight: 4 oz (113 gr)

REPLACEMENT PARTS

PHH-3X-R: Electrode
PH-BATT-1X12: 1.35 V Batteries, 12-pack
PH-BATT-1: 1.35 V Battery (3 required)
PHA-4: Buffer solution, pH 4.0
PHA-7: Buffer solution, pH 7.0
PHA-10: Buffer solution, pH 10.0

OMEGA ENGINEERING, INC.
One Omega Drive, P.O. Box 4047
Stamford, CT 06907
Tel: (203) 359-1660
Telex: 996404 Cable OMEGA
Fax: (203) 359-7700

MADE IN USA

WARRANTY

OMEGA warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of 13 months from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that our customers receive maximum coverage on each product. EXCEPTION: The replaceable pH electrode is not covered by this warranty. If the unit should malfunction, it must be returned to the factory for evaluation. Our Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. However, this WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

We are glad to offer suggestions on the use of our *various products*. Nevertheless OMEGA only warrants that the *parts* manufactured by it will be as specified and free of defects.

OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

LIMITATION OF LIABILITY: The remedies of buyer set forth herein are exclusive and the total liability of *OMEGA with* respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the *purchase* price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

Every precaution for accuracy has been taken in the preparation of this manual; however, OMEGA ENGINEERING, INC. neither assumes responsibility for any omissions or errors that may appear nor assumes liability for any damages that result from the use of the products in accordance with the information contained in the manual.

RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA ENGINEERING Customer Service Department. Call toll free in the USA and Canada: 1-800-622-2378, FAX: 203-359-7611; International: 203-359-1660, FAX: 203-359-7807.

BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, YOU MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OUR CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems you are having with the product.

FOR **NON-WARRANTY** REPAIRS OR **CALIBRATION**, consult OMEGA for current repair/calibration charges. Have the following information available BEFORE contacting OMEGA:

1. Your P.O. number to cover the COST of the of the repair/calibration,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems you are having with the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. That way our customers get the latest in technology and engineering.

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Printed in U.S.A.

11785ML-99 B

solution looks the same throughout. If the solution looks as if it has little lumps, shake more until they disappear. If this chemical is spilled, it should be cleaned up carefully and completely as soon as possible because it is very slick. To clean up the polymer, use paper towels or cloths. The Polymer is cafe to touch, and you should cleaned until the surface is dry. Set the Polymer jar in a place were it won't be broken. It will be needed later in the process.

3. As stated before, after the water has reached the proper temperature of 85 F in the winter or above 75 F in the summer. Turn off the air control valve and reduce the air pressure to 10 psi and then turn it back on also turn the mixer switch to the "OFF" position. The air flow should be gentle, causing a fine flow of bubbles to appear at the top of the water surface. The flow of bubbles should not be high enough to agitate the water. They should merely rise to the surface gently.

4. Turn the stirrer switch to "ON" position at this time. Let it stir for about 3 minutes before going to the next step.

5. Shake the Kwick Flock container until there are no solids on the bottom of the jug. Pour (1) one gallon of the Kwick Flock liquid into the center vortex of the stirring waste water. Rinse the Kwick Flock jug out with water and add to treatment tank. Let it stir for about 3 minutes. It is recommended that the Kwick Flock be shaken a few hours before treatment starts. This procedure is not essential, but it makes it easier to get complete suspension later.

6. Check the Control Acid and Control Base for adequate volume of solution. Half of a gallon of solution will be adequate.

<u>CAUTION</u>

The Base Control and Acid Control come to you ready to use. They are both corrosive and must be handled with care. <u>Always wear eye protection and rubber gloves when working around these chemicals.</u>

7. Using the hand held pH probe check the pH of the water. Now using the Acid Control pour a small amount into the tank. Let stir for a minute. Check the pH with the meter, bring the pH down to 3 or a little below. The lower you take the pH the more chemical it will take to bring it up. After you reach this level, let it stir for about thirty seconds. Now using the Base Control, slowly bring the pH back up to 7.5 to 8.5 pH. This will take some practice to do this. If you over shoot the upper pH, just add Acid to bring it down.

8. Examine the Polymer that was mixed earlier and be sure that the solution does not have solid particles in it. If it does not, slowly pour it into the waste water in about the

MATERIAL SAFETY DATA SHEET

Section I - Product Identity

Product Name (same as on label): **KWICK KLEEN ACID CONTROL**
Product class: ACID
DOT ID Number: UN1789 **DOT Hazard Classification:** Corrosive material

DOT Proper Shipping Name: Acid solution

Manufacturer: Kwick Kleen Industrial Solvents
Address: 1202 Barnett PO Box 807
Vincennes, Indiana 47591

HMIS HAZARD RATING:

4=Extreme	Health.....................3
3=High	Flammability...........0
2=Moderate	Reactivity................1
1=Slight	
0=Very Low	Personal Protection: goggles, gloves, apron

Information Telephone Number 812-882-3967
Emergency of spill, leak, fire, exposure, or accident 1-800-424-9300(CHEMTREC)

Section II - Hazardous Ingredients

Ingredient (CAS No.)	% Wt.	Occupational Exposure Limit		Vap Pres.
*Hydrochloric acid (7647-01-0)	6	Ceiling limit	5 ppm	50-60 mm HG 20°C

*Denotes a chemical substance subject to reporting requirements under SARA Title III, Section 313, 40 CFR part 372.

Section III - Physical Data

Boiling Point: Less than 100°C

Vapor Density: 1.27

Evaporation rate: Less than butyle acetate

% Volatile by weight: 100%

Specific gravity: 1.03

Flash point (PMCC0): Does not apply

Appearance and odor: Light yellow liquid

PH <: 1

Section IV - Fire and Explosion

Flammability classification: Not flammable

Unusual fire and explosion hazards: Will react with metals, i.e. aluminum, tin and zinc, to release flammable hydrogen gas.

Special fire fighting procedures: Self contained breathing apparatus with positive-pressure should be used. Use water spray to cool fire exposed containers.

Section V - Reactivity Data

Stability: ____X____Stable _________Unstable

Hazardous polymerization: NO

Hazardous decomposition products: Heat can cause evolution of gaseous hydrogen chloride.

Conditions to avoid: Most metals, propylene oxide, carbonates, cyanides, and sulfides.

Materials to avoid: Acids, chlorinated hydrocarbons, acetaldehyde, aluminum, tin, and zinc.

Section VI - Health Hazard Data:

Effect of acute overexposure unless noted as chronic.

a. **Inhalation:** Can cause destructive burns of the muscous membranes. Severe pneumonitis may occur.

b. **Skin:** Will cause skin irritation. Proglonged exposure will cause severe burns with scarring.

c. **Ingestion:** Swallowing will cause severe burns of the mouth, throat and stomach. Moderately toxic.

d. **Eyes:** Contact with eyes causes rapid tissue destruction leading to permanent eye damage and possible blindness.

Medical conditions generally aggravated by exposure: Persons with known allergies, diabetes, heart or respiratory problems should observe extra care.

MATERIAL SAFETY DATA SHEET

Section I - Product Identity

Product Name (same as on label): **KWICK KLEEN ALKALINE BASE CONTROL**
Product Class: ALKALI
DOT ID Number: UN1824 **DOT Hazard Classification:** Corrosive material
DOT Proper Shipping Name: Sodium hydroxide solution

Manufacturer: Kwick Kleen Industrial Solvents
Address: 1202 Barnett PO Box 807
Vincennes, Indiana 47591

Information Telephone Number 812-882-3987
Emergency of spill, leak, fire, exposure, or accident 1-800-424-9300 (CHEMTREC)

HMIS HAZARD RATING:

4=Extreme	Health......................3
3=High	Flammability...........0
2=Moderate	Reactivity................1
1=Slight	
0=Very Low	Personal Protection: goggles, gloves, apron

Section II - Hazardous Ingredients

Ingredient (CAS No.)	% Wt.	Occupational Exposure Limit		Vap Pres.
*Sodium Hydroxide (1310-73-2)	7.27	ACGIH ceiling	2 mg/m^3	Not reported
		OSHA 8 hr, TWA	2 mg/m^3	

*Denotes a chemical substance subject to reporting requirements under SARA Title III, Section 313, 40 CFR part 372.

Section III - Physical Data

Boiling range of solvents: Less than 100°C

% Volatile by weight: 95%

Weight per gallon: 8.74

Flash point (PMCC0): Nonflammable

Appearance and odor: Clear liquid

Specific gravity: 1.05

PH >: 12

Section IV - Fire and Explosion

Flammability classification: Noncombustible liquid

Extinguishing media: Noncombustible-use extinguishing media suitable for surrounding materials

Special fire fighting procedures: NIOSH approved, self-contained breathing apparatus should be used.

Section V - Reactivity Data

Stability: __X__ Stable ______ Unstable
Hazardous polymerization: NO
Hazardous decomposition products: Will not decompose
Conditions to avoid: Acids, flammable liquids, organic halogenated compounds.

Section VI - Health Hazard Data

Effect of acute overexposure unless noted as chronic.

a. **Inhalation:** Can cause destructive burns of the mucous membranes. Severe pneumonitis may occur.
b. **Skin:** Will cause skin irritation. Prolonged exposure will cause severe burns with scarring.
c. **Ingestion:** Swallowing will cause severe burns of the mouth, throat and stomach.
d. **Eyes:** Contact with eyes causes rapid tissue destruction leading to permanent eye damage and possible blindness.

Medical conditions generally aggravated by exposure: Persons with known allergies, diabetes, heart or respiratory problems should observe extra care.

Chemical listed as carcinogen:

	Yes	No
NTP		X
IARC monographs		X
OSHA		X

First aid and emergency procedures:

a. **Inhalation:** Remove patient to fresh air and assist with respiration if necessary. Obtain medical attention.
b. **Skin:** Remove contaminated clothes and flush with water for 15 min. If irritation persists, get medical attention.

MATERIAL SAFETY DATA SHEET

Section I - Product Identity

Product Name (same as on label): KWICK KLEEN KWICK FLOCK
DOT ID Number: Nos **DOT Hazard Classification:** ORM-A
DOT Proper Shipping Name: None

Manufacturer: Kwick Kleen Industrial Solvents
Address: 1202 Barnett PO Box 807
Vincennes, Indiana 47591

Information Telephone Number 812-882-3967
Emergency of spill, leak, fire, exposure, or accident 1-800-424-9300 (CHEMTREC)

HMIS HAZARD RATING:

4=Extreme	Health....................2
3=High	Flammability..........0
2=Moderate	Reactivity...............0
1=Slight	
0=Very Low	Personal Protection: goggles, gloves, apron

Section II - Hazardous Ingredients

Product is proprietary.

Section III - Physical Data

Boiling range of solvents: Does not apply

% Volatile by weight: 91%

Weight per gallon: 9.22

Specific gravity: 1.1

Flash point (PMCC0): Nonflammable

Appearance and odor: Red solution

Section IV - Fire and Explosion

Flammability classification: Not flammable

Extinguishing media: Product does not burn

Unusual fire and explosion hazards: Product is water soluble and water may be acidic.

Special fire fighting procedures: None known

Section V - Reactivity Data

Stability: ___X___Stable ________Unstable

Hazardous polymerization: NO

Hazardous decomposition products: None until 100°C, then sulfur trioxide.

Conditions to avoid: None known. Solution corrosive to mild steel and galvanized steel.

Section VI - Health Hazard Data

Effect of acute overexposure unless noted as chronic.

a. **Inhalation:** Solution dust can cause irritation of the mucous membranes.

b. **Skin:** Will cause skin irritation.

c. **Ingestion:** Not toxic orally.

d. **Eyes:** Contact with eyes is corrosive to eyes.

Medical conditions generally aggravated by exposure: Persons with known allergies, diabetes, heart or respiratory problems should observe extra care.

Chemical listed as carcinogen:			
	NTP	________Yes	___X___No
	IARC monographs	________Yes	___X___No
	OSHA	________Yes	___X___No

First aid and emergency procedures:

a. **Inhalation:** Remove patient to fresh air. Obtain medical attention immediately.

b. **Skin:** Remove contaminated clothes and flush with water for 15 min. If irritation persists, get medical attention.

MATERIAL SAFETY DATA SHEET

Section I - Product Identity

Product Name (same as on label): **Polymer**

HMIS HAZARD RATING:

4=Extreme	Health..........0
3=High	Flammability..........1
2=Moderate	Reactivity..........0
1=Slight	
0=Very Low	Personal Protection: goggles, gloves, apron

Manufacturer: Kwick Kleen Industrial Solvents
Address : 1202 Barnett PO Box 807
Vincennes, Indiana 47591

Information Telephone Number 812-882-3967
Emergency of spill, leak, fire, exposure, or accident 1-800-424-9300 (CHEMTREC)

Section II - Hazardous Ingredients

THIS SECTION NOT APPLICABLE

Section III - Physical Data

Boiling range:: Decomposes
Vapor Pressure: Very Low
Solubility in water: complete
Appearance and odor: granular white powder
Specific Gravity: .8g/cc at 72°F

Section IV - Fire and Explosion

Extinguishing media: Dry chemical, CO_2, Water fog, Foam.
Unusual fire and explosion hazards: Decomposition produces carbon monoxide, hydrogen chloride and carbon dioxide, ammonia.
Special fire fighting procedures: Self contained breathing apparatus should be used. Remove container from fire area if it can be done safely. If not, keep container cool with water. Avoid spreading burning liquid with water used for cooling purposes. Burning may produce toxic fumes!

Section V - Reactivity Data

Stability: __X__ Stable ______ Unstable
Hazardous polymerization: NO
Hazardous decomposition products: carbon monoxide, hydrogen chloride, carbon dioxide, ammonia
Conditions to avoid: Strong oxidizing materials, heat

Section VI - Health Hazard Data

a. **Inhalation:** slight irritation
b. **Skin:** irritation to open avrasionsc.
c. **Ingestion:** slight irritation to mucous membrane
d. **Eyes:** irritation

Medical conditions generally aggravated by exposure: Persons with known allergies, diabetes, heart or respiratory problems should observe extra care.

Chemical listed as carcinogen:

	Yes	No
NTP		X
IARC monographs		X
OSHA		X

First aid and emergency procedures:

a. **Inhalation:** Remove patient to fresh air and assist with respiration if necessary. Obtain medical attention.
b. **Skin:** Remove contaminated clothes and flush with soap and water for 15 min. If irritation persists, get medical attention.
c. **Ingestion:** Get medical attention.
d. **Eyes:** Wash with large amounts of water for 15 minutes lifting lids occasionally for complete washing. Get medical attention.

Section VII - Special Protection

a. **Inhalation:** None if used in adequate ventilation .
b. **Skin:** Apron and boots should be worn. Wash with soap and water after use.
c. **Ingestion:** Do not eat, drink, or smoke in the work area. Wash thoroughly before eating, or drinking.
d. **Eyes:** Safety goggles should be worn.

Section VIII - Spill or Leak Procedure

Spills become slippery when wet. Wipe up immediately. If spills become wet, first remove with inert material, then flush area with water. Dike and contain. Clean up with vacuum truck. Flush area with water.

Waste Disposal Method: As prescribed by local regulations regarding disposal of organic chemical wastes .

R000091

RECEIVED
SPRINGFIELD REGION
SEP 12 2003
ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

LAND DISPOSAL RESTRICTION NOTIFICATION FORM 1

Generator Name/Location EVERGREEN AVIATION, ROUTE 48 WEST, TAYLORVILLE, ILLINOIS 62568

EPA ID Number ILD982621690 Manifest Number IL 10264033

Waste Analysis Available X Yes ____ No X On file at facility Date 9/4/03

PROFILE #	RCRA NON-REGULATED Please check if waste stream is not regulated by RCRA.	RCRA WASTE CODES (List all that apply)	SUBCATEGORY (See Table II and Select Key # if applicable).	TREATABILITY GROUP Please check the applicable treatability group.		CALIFORNIA LIST WASTES	REGULATED CONSTITUENTS FOR D001*, D002, D012-D043, F001-F005 & F039
a	b	c	d	Nonwastewater >1% TOC & >1% TSS e	Wastewater f	List all applicable constituents from key below g	List all applicable constituents from Table I and/or key below h
248936		D002,F002		X			249
248937		D001		X			249

CALIFORNIA LIST WASTES (for Column g)

1) PCB > = 50 ppm 2) Halogenated Organic Carbon (HOC's) > = 1000 mg/l 3) Nickel (Ni) > = 134 mg/l 4) Thallium (Tl)

REGULATED CONSTITUENTS FOR F001, F002, F003, F004, F005 (for Column h)

5) Acetone
6) Benzene
7) N-Butly Alcohol
8) Carbon Disulfide
9) Carbon Tetrachloride
10) Chlorobenzene
11) Cresols (o,m, or p isomers)
12) Cresylic Acid
13) Cyclohexanone
14) 1,2-Dichlorobenzene
15) Ethyl Acetate
16) Ethyl Benzene
17) Ethyl Ether
18) Isobutanol (Isobutyl alcohol)
19) Methanol
20) Methylene Chloride
21) Methyl Ethyl Ketone
22) Methyl Isobutyl Ketone
23) Nitrobenzene
24) Pyridine
25) Tetrachloroethylene
26) Toluene
27) 1,1,1 Trichloroethane
28) 1,1,2 Trichloroethane
29) 1,1,2 Trichloro 1,2,2 T
30) Trichloroethylene
31) Trichlorofluoromethane
32) Xylene (Total)

I certify under penalty of law that the above information is accurate and true.

Signature [signature] WHITE - PCI

Print Name ROBT BRANDIS YELLOW - GENERATOR

0210600007 - Christian County
Taylorville/The Paint Shop
ILD982621690
FOS File

Attachment F

p.1 2178248033 brandis

THE PAINT SHOP

NUMBERS FOR EMERGENCIES

FIRE:	Call 911- Taylorville Fire Department, Give Location #_______ , Building P1-Tan Hanger
POLICE:	Call 911- City Police, Give Location-Airport, South Hanger, #P1
MEDICAl EMERGENCY:	911- For Rescue or Ambulance
For Hospital:	824-3331

THE PAINT SHOP

September 2nd, 2003

Taylorville Fire Department
112 West Vine
Taylorville, Illinois 62568

Attention: Fire Chief

As part of our Emergency Response Plan, we wish to advise your department that should an emergency arise from a fire, our location number is 1079, 2301 South Spresser, Building marked "P1": Fire hydrant is directly across the highway from the building.

We work with water rinsed paint, stripper, (non flammable), MEK, polyurethane and epoxy base paints. Normal stocks are 1 gallon and 5 gallon quantities in the work area.

A site plan is available upon request.

Please advise me if you need any further information.

Sincerely,

Robert J. Brandis

THE PAINT SHOP

September 2nd, 2003

Taylorville Police Department
108 W. Vine
Taylorville, Illinois 62568

Attention: Police Chief Brotherton

As part of our Emergency Response Plan, we wish to advise your department that we have listed the Taylorville Police Department as the primary authority should a police emergency evolve, not the Sheriffs Department, since we are, I believe, in the City of Taylorville. We are located at the Taylorville Municipal Airport, 2301 South Spresser, Building P1.

Please advise me if you need any further information.

Sincerely,

Robert J. Brandis

THE PAINT SHOP

September 2nd, 2003

St. Vincents Hospital
201 East Pleasant
Taylorville, Illinois 62568

Attention: Dan Raab,

As Part of our Emergency Response Plan, we wish to advise the emergency department as to the type of possible emergency medical response that could arise. We have employees working with dust, paint chips, paint strippers and paint. Paints are non lead, polyurethane: chemicals are lacquer thinner, MEK, water neutralized strippers (formic acid and methl chloride base; possible skin burns or eye irritations).

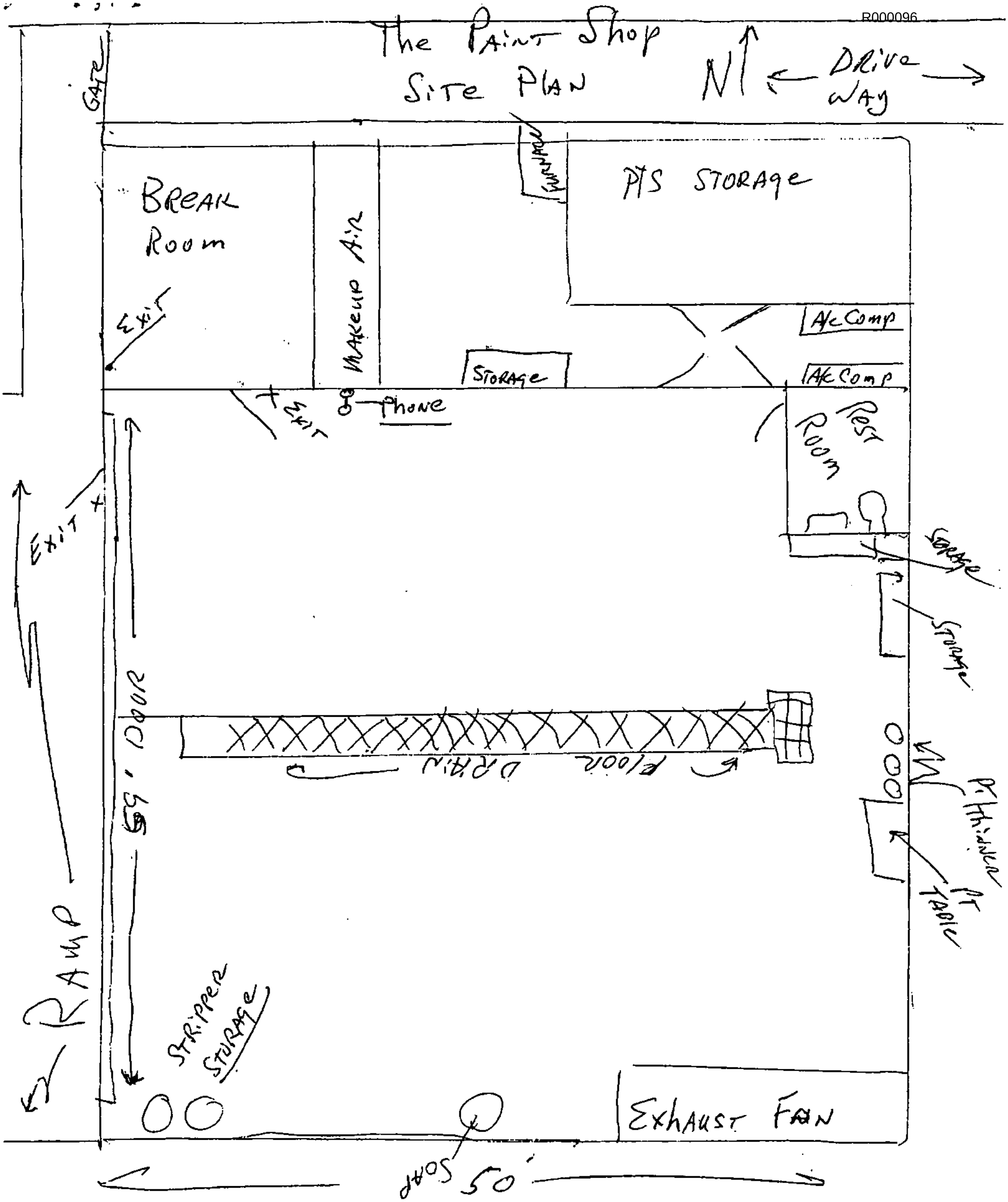
Please advise if any further information is needed to be prepared should an emergency arise.

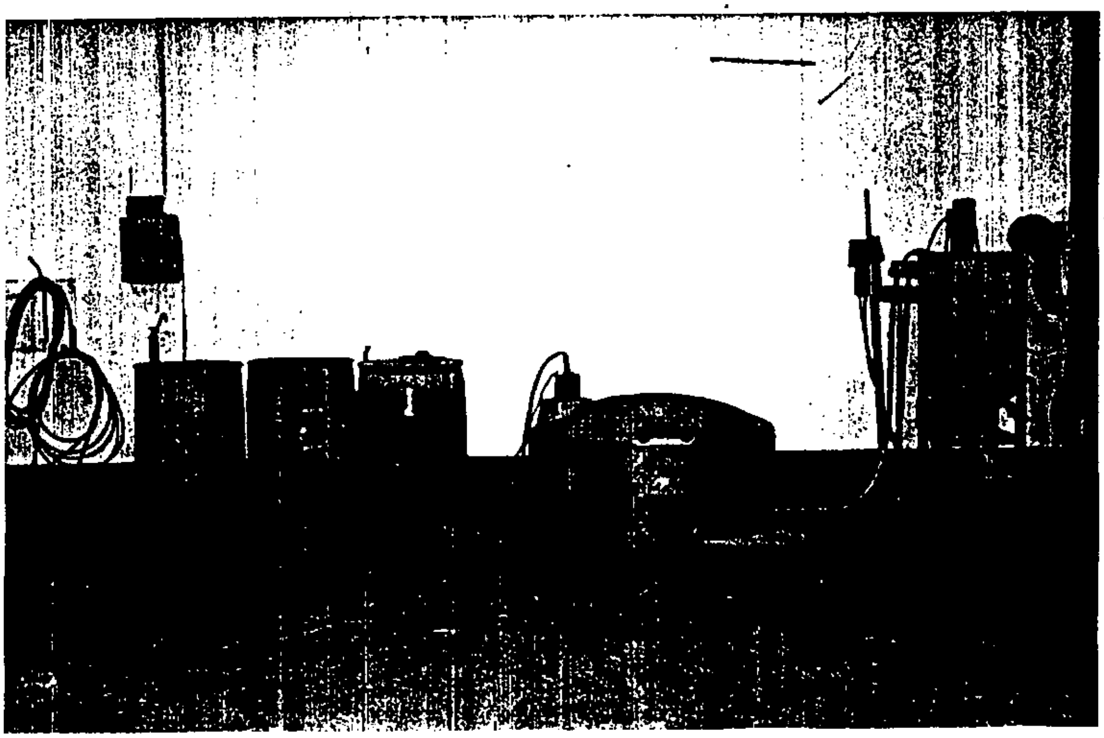
Sincerely

R J Brandis

Robert J. Brandis

R000096


The Paint Shop
Site Plan
N
Drive way
Gate
Break Room
Makeup Air
Furnace
P/S Storage
Exit
Storage
A/c Comp
A/c Comp
Exit
Phone
Rest Room
Storage
Storage
Exit
55' Door
Floor Drain
P. thinner
PT Table
Ramp
Stripper Storage
Exhaust Fan
Soap
50'



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276, 217-782-3397
JAMES R. THOMPSON CENTER, 100 WEST RANDOLPH, SUITE 11-300, CHICAGO, IL 60601, 312-814-6026

ROD R. BLAGOJEVICH, GOVERNOR RENEE CIPRIANO, DIRECTOR

September 25, 2003

The Paint Shop
2301 S. Spresser
Taylorville, IL 62568

Attention: Mr. Michael J. Brandis

Re: LPC #0210600007 - Christian County
Taylorville/The Paint Shop
ILD982621690
Compliance File

Dear Mr. Brandis:

On August 29, 2003, Steve Townsend representing the Illinois Environmental Protection Agency conducted an inspection of the above referenced site. The purpose of this inspection was to determine your compliance with the Illinois Environmental Protection Act and 35 Illinois Administrative Code 703, 721, 722, 726, 728, 739 and 808 of the regulations.

During the inspection apparent violations were noted for 35 Illinois Administrative Code 722.111 - Hazardous Waste Determination; 722.134 - Preparedness and Prevention - Compliance with 725.137 – Agreements with Local Emergency Response Organizations (LEROs); and 722.134(d)(5) - Preparedness and Prevention – Posted information near phone. During and following the inspection, Mr. Robert Brandis, representing The Paint Shop, spoke with Mr. Townsend and compiled a list of what was needed to document compliance. The documentation to show compliance by your facility was subsequently submitted. As a result of reviewing these documents, the apparent violations were determined to have been resolved as the inspection report was being compiled. The final report reflects the resolution of the deficiencies noted during the inspection. The documents submitted have been placed in our files with the report.

During the inspection it was also learned that the facility formerly listed in our inventory as Brandis Aircraft (LPC #0210600007 and USEPA #ILD982621690) is currently run as two separate businesses. These businesses are now listed in our inventory as The Paint Shop (LPC #0210600007 and USEPA #ILD982621690), and Evergreen Aviation (LPC #0210605081 – no USEPA number assigned). As Mr. Townsend informed you during the inspection, please use only the Illinois EPA and USEPA assigned name and number for all documents requiring the use of a USEPA or State ID number. Such documents include waste manifests. For your information, a copy of the inspection report is enclosed.

Finally, we recommend you certify that your dry, spent paint filters are not a special waste, so that a manifest is not needed to transport them to the landfill. Please read the enclosed fact sheet and complete the enclosed form and return it to this office.

Thank you for your cooperation. Should you have any questions regarding this inspection, please contact Mr. Townsend 217/786-6892.

Sincerely,

David C. Jansen

David C. Jansen
Springfield Region Manager
Field Operations Section
Division of Land Pollution Control

DCJ/SCT/rr(U:\SCT\SCT-Letters\The Paint ShopLTR.doc)

Enclosures

cc: DLPC/Division File
DLPC/FOS - Springfield Region

R000100

Completed Date: 9-17-14

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

BUREAU OF LAND / FIELD OPERATIONS SECTION

RCRA INSPECTION REPORT

GENERAL FACILITY INFORMATION

USEPA ID #:	ILD982621690			**BOL ID #:**	0210600007
Facility Name:	THE PAINT SHOP			**Phone #:**	217/824-8032
Location	2301 S SPRESSER			**County:**	CHRISTIAN
City:	TAYLORVILLE	**State:**	IL	**Zip Code:**	62568
Region:	SPRINGFIELD	**Inspection Date:**	May 16, 2014	**Time:**	9:10 to 15:00
Weather:	52 ° F ~ Overcast				

TYPE OF FACILITY

Notified As:	N/A	**Regulated As:**	G-1, TSD

TYPE OF INSPECTION

CEI: ☒	**CME/O&M:** ☐	**CSI:** ☐	**NRR:** ☐	**CCI:** ☐	**PIF:** ☐	**CVI:** ☐	**CSE:** ☐	**CAO:**
FUI to: ☐		**Other:**						

NOTIFICATION INFORMATION (EPA 8700-12)

Notification Date:	**(initial)**	**(subsequent)**

PART A PERMIT INFORMATION (EPA 3510-3 OR EPA 8700-23)

Part A Date:	N/A	**Amended:**	**Withdrawn:**

PART B PERMIT INFORMATION

(Check one if applicable) Application Submitted? ☐	**Permit Issued?** ☐	**Date:**

ACTIVE ENFORCEMENT

Date facility referred to:	**USEPA:**	**IAGO:**	**County State's Attorney:**

ACTIVE ENFORCEMENT ORDERS

CACO:	**CAFO:**	**Federal Court Order:**
Consent Decree:	**IPCB Order:**	**State Court Order:**

TSD Facility Activity Summary

Activity by Process Code	On Part A?	On Part B?	Activity ever done?	Closed?	Being done during inspection?	Exempt per 35 IAC Sec:	On Annual Report:		
S01	☐	☐	☒	☐	☒		☐	☐	☐
T04	☐	☐	☒	☐	☒		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐

Owner / Operator

Owner				Operator			
Name:	Peoples Bank & Trust, a banking corporation, as Trustee of Land Trust Agreement 3835			**Name:**	Brandis Aircraft, LLC and Evergreen Aviation, Inc.		
Address:	P.O. Box 620			**Address:**	2301 S SPRESSER		
City:	TAYLORVILLE			**City:**	TAYLORVILLE		
State:	ILLINOIS	**Zip Code:**	62568	**State:**	ILLINOIS	**Zip Code:**	62568
Phone #:	217-824-8032			**Phone #:**	217-824-8032		

Person(s) Interviewed

Person(s) Interviewed	Title	Phone #
ROBERT BRANDIS	Operator	217-824-8032
MICHAEL BRANDIS	Operator	217-824-8032

Inspection Participants

STEVE TOWNSEND*	IEPA/BOL-DLPC-FOS	217/557-8761
PAUL EISENBRANDT	IEPA/BOL-DLPC-FOS	217/557-8761

Summary of Apparent Violations

Area	Section	X	Area	Section	X	Area	Section	X
	703.121(a)	☒		725.116(a)	☒		725.242(a)	☒
	703.121(b)	☒		725.137	☒		739.122	☒
	703.150(a)	☒		725.151(a)	☒		809.201	☒
	722.134(a)	☒		722.111	☒		809.301	☒
	722.134(a)(2)	☒		808.121(a)	☒		809.302	☒
	- 725.271	☒		725.113(a)	☒	ACT	21(f)(1)	☒
	- 725.272	☒		725.113(b)	☒	ACT	21(f)(2)	☒
	- 725.273(b)	☒		725.115(a)	☒	ACT	21(i)	☒
	- 725.274	☒		725.115(b)	☒	ACT	21(j)	☒
	722.134(a)(3)	☒		725.173	☒			
	722.134(a)(4)	☒		725.212(a)	☒			

ACT = Apparent violation of Illinois Environmental Protection Act **X** = Continuing Violations
RTC = Returned to Compliance

RCRA Violations Checklist

IEPA #: 0210600007   Inspection Date: May 16, 2014 & June 5, 2014

Section	V	C	R
Part 722			
722.111	☒	☐	☐
722.112(a)	☐	☐	☐
722.112(c)	☐	☐	☐
722.120(a)	☐	☐	☐
722.120(b)	☐	☐	☐
722.120(d)	☐	☐	☐
722.121(a)	☐	☐	☐
722.121(g)	☐	☐	☐
722.122	☐	☐	☐
722.123(a)	☐	☐	☐
722.123(b)	☐	☐	☐
722.123(c)	☐	☐	☐
722.123(f)	☐	☐	☐
722.127	☐	☐	☐
722.130	☐	☐	☐
722.131	☐	☐	☐
722.132	☐	☐	☐
722.133	☐	☐	☐
722.134(m)	☐	☐	☐
722.140(a)	☐	☐	☐
722.140(b)	☐	☐	☐
722.140(c)	☐	☐	☐
722.140(d)	☐	☐	☐
722.141(a)	☐	☐	☐
722.141(b)	☐	☐	☐
722.142(a)(1)	☐	☐	☐
722.142(a)(2)	☐	☐	☐
722.142(c)	☐	☐	☐
722.143	☐	☐	☐
Part 808 – Special Waste Determination			
808.121(a)	☒	☐	☐
LQG Permit Exemption Criteria *The generator must comply with certain sections of Parts 722, 725, and 728. Mark the checkboxes of any unmet criteria, but cite the violation as 703.121(a) and (b), not as the unmet criteria.*			
703.121(a)	☒	☐	☐
703.121(b)	☒	☐	☐

V = Violation Observed; C = Continuing; R = Resolved

LQG Permit Exemption Criteria

Section

Part 722
- ☒ 722.134(a)
- ☐ 722.134(a)(1)
- ☒ 722.134(a)(2)
- ☒ 722.134(a)(3)
- ☒ 722.134(a)(4)
- ☐ 722.134(c)
- ☐ 722.134(g)

Part 725
725.Subpart B
- ☒ 725.116(a)
- ☐ 725.116(b)
- ☐ 725.116(c)
- ☐ 725.116(d)
- ☐ 725.116(e)

725.Subpart C
- ☐ 725.131
- ☐ 725.132
- ☐ 725.133
- ☐ 725.134
- ☐ 725.135
- ☒ 725.137

725.Subpart D
- ☒ 725.151(a)
- ☐ 725.151(b)
- ☐ 725.152(a)
- ☐ 725.152(c)
- ☐ 725.152(d)
- ☐ 725.152(e)
- ☐ 725.152(f)
- ☐ 725.153
- ☐ 725.154
- ☐ 725.155
- ☐ 725.156

725.Subpart I
- ☒ 725.271
- ☒ 725.272
- ☐ 725.273(a)
- ☒ 725.273(b)
- ☒ 725.274
- ☐ 725.276
- ☐ 725.277
- ☐ 725.278

Section

725.Subpart J
- ☐ 725.291(a)
- ☐ 725.291(b)
- ☐ 725.291(c)
- ☐ 725.292(a)
- ☐ 725.292(g)
- ☐ 725.293(a)
- ☐ 725.293(b)
- ☐ 725.293(c)
- ☐ 725.293(d)
- ☐ 725.293(e)
- ☐ 725.293(f)
- ☐ 725.293(i)
- ☐ 725.294(a)
- ☐ 725.294(b)
- ☐ 725.295(b)
- ☐ 725.295(c)
- ☐ 725.295(d)
- ☐ 725.295(e)
- ☐ 725.295(f)
- ☐ 725.295(g)
- ☐ 725.296
- ☐ 725.296(d)
- ☐ 725.296(e)
- ☐ 725.296(f)
- ☐ 725.297(a)
- ☐ 725.297(b)
- ☐ 725.298(a)
- ☐ 725.298(b)
- ☐ 725.299
- ☐ 725.300
- ☐ 725.302

725.Subpart AA
- ☐ 725.932(a)
- ☐ 725.932(b)
- ☐ 725.932(c)
- ☐ 725.932(d)
- ☐ 725.933(a)
- ☐ 725.933(b)
- ☐ 725.933(c)
- ☐ 725.933(d)
- ☐ 725.933(e)
- ☐ 725.933(f)
- ☐ 725.933(g)
- ☐ 725.933(h)

Section

725. AA, cont.
- ☐ 725.933(i)
- ☐ 725.933(j)
- ☐ 725.933(k)
- ☐ 725.933(l)
- ☐ 725.933(m)
- ☐ 725.933(n)
- ☐ 725.934
- ☐ 725.935(a)
- ☐ 725.935(b)
- ☐ 725.935(c)
- ☐ 725.935(d)
- ☐ 725.935(e)
- ☐ 725.935(f)

725.Subpart BB
- ☐ 725.950(c)
- ☐ 725.950(d)
- ☐ 725.952(a)
- ☐ 725.952(c)
- ☐ 725.953(a)
- ☐ 725.953(b)
- ☐ 725.953(c)
- ☐ 725.953(d)
- ☐ 725.953(e)
- ☐ 725.953(g)
- ☐ 725.954(a)
- ☐ 725.954(b)
- ☐ 725.955(a)
- ☐ 725.955(b)
- ☐ 725.956(a)
- ☐ 725.956(b)
- ☐ 725.957(a)
- ☐ 725.957(c)
- ☐ 725.957(d)
- ☐ 725.958(a)
- ☐ 725.958(c)
- ☐ 725.960
- ☐ 725.961
- ☐ 725.962
- ☐ 725.963
- ☐ 725.964(b)
- ☐ 725.964(c)
- ☐ 725.964(d)
- ☐ 725.964(e)
- ☐ 725.964(f)
- ☐ 725.964(g)
- ☐ 725.964(h)
- ☐ 725.964(i)

Section

725. BB, cont.
- ☐ 725.964(j)
- ☐ 725.964(k)
- ☐ 725.964(l)
- ☐ 725.964(m)

725.Subpart CC
- ☐ 725.982(a)(1)
- ☐ 725.982(b)(1)
- ☐ 725.982(c)
- ☐ 725.983(b)
- ☐ 725.984(a)(1)
- ☐ 725.984(a)(2)
- ☐ 725.984(b)(1)
- ☐ 725.984(b)(2)
- ☐ 725.984(c)(1)
- ☐ 725.984(c)(2)
- ☐ 725.984(d)
- ☐ 725.985(b)
- ☐ 725.985(c)(1)
- ☐ 725.985(c)(2)
- ☐ 725.985(c)(3)
- ☐ 725.985(c)(4)
- ☐ 725.985(d)
- ☐ 725.985(e)
- ☐ 725.985(f)
- ☐ 725.985(g)
- ☐ 725.985(h)
- ☐ 725.985(i)
- ☐ 725.985(j)
- ☐ 725.985(k)
- ☐ 725.986(b)
- ☐ 725.986(c)(1)
- ☐ 725.986(c)(2)
- ☐ 725.986(c)(3)
- ☐ 725.986(d)
- ☐ 725.986(e)
- ☐ 725.986(f)
- ☐ 725.986(g)
- ☐ 725.987(b)(1)
- ☐ 725.987(b)(2)
- ☐ 725.987(c)(1)
- ☐ 725.987(c)(2)
- ☐ 725.987(c)(3)
- ☐ 725.987(c)(4)

NA = Not Applicable; NE = Not Evaluated

RCRA Violations Checklist

IEPA #: 0210600007 Inspection Date: May 16, 2014 & June 5, 2014

LQG Permit Exemption Criteria

Section	Section
725.CC, cont.	*725.Subpart DD*
☐ 725.987(c)(5)	☐ 725.1101(a)(1)
☐ 725.987(d)(1)	☐ 725.1101(a)(2)
☐ 725.987(d)(2)	☐ 725.1101(a)(3)
☐ 725.987(d)(3)	☐ 725.1101(a)(4)
☐ 725.987(d)(4)	☐ 725.1101(b)(1)
☐ 725.987(e)(1)	☐ 725.1101(b)(1)
☐ 725.987(e)(2)	☐ 725.1101(b)(2)
☐ 725.987(e)(6)	☐ 725.1101(b)(2)(A)
☐ 725.987(f)	☐ 725.1101(b)(2)(B)
☐ 725.987(g)	☐ 725.1101(b)(3)
☐ 725.987(h)	☐ 725.1101(b)(3)(B)
☐ 725.988(b)(1)	☐ 725.1101(b)(3)(C)
☐ 725.988(b)(2)	☐ 725.1101(c)(1)(A)
☐ 725.988(b)(3)	☐ 725.1101(c)(1)(B)
☐ 725.988(b)(4)	☐ 725.1101(c)(1)(C)
☐ 725.988(c)(1)(A)	☐ 725.1101(c)(1)(D)
☐ 725.988(c)(1)(B)	☐ 725.1101(c)(2)
☐ 725.988(c)(1)(C)	☐ 725.1101(c)(3)
☐ 725.988(c)(2)	☐ 725.1101(c)(3)(A)
☐ 725.988(c)(2)(A)	☐ 725.1101(d)
☐ 725.988(c)(2)(D)	☐ 725.1102
☐ 725.988(c)(2)(E)	
☐ 725.988(c)(2)(F)	*Part 728*
☐ 725.988(c)(3)	☐ 728.107(a)(5)
☐ 725.988(c)(3)(A)	
☐ 725.988(c)(3)(B)	
☐ 725.988(c)(4)	
☐ 725.988(c)(5)(A)	
☐ 725.988(c)(5)(B)	
☐ 725.988(c)(5)(C)	
☐ 725.988(c)(5)(D)	
☐ 725.988(c)(5)(E)	
☐ 725.988(c)(6)	
☐ 725.988(c)(7)	
☐ 725.989(a)	
☐ 725.989(b)	
☐ 725.990(a)	
☐ 725.990(b)(1)	
☐ 725.990(b)(2)	
☐ 725.990(c)	
☐ 725.990(d)	
☐ 725.990(e)	
☐ 725.990(f)	
☐ 725.990(g)	
☐ 725.990(i)	
☐ 725.990(j)(1)	
☐ 725.990(j)(2)	

Section	V	C	R	Section	V	C	R
LQG Closure Requirements				*Additional Requirements*			
725.211	☐	☐	☐		☐	☐	☐
725.214	☐	☐	☐		☐	☐	☐
Additional Violations Noted					☐	☐	☐
703.150(a)(2)	☒	☐	☐		☐	☐	☐
725.113(a)	☒	☐	☐		☐	☐	☐
725.113(b)	☒	☐	☐		☐	☐	☐
725.115(a)	☒	☐	☐		☐	☐	☐
725.115(b)	☒	☐	☐		☐	☐	☐
725.173	☒	☐	☐		☐	☐	☐
725.212(a)	☒	☐	☐		☐	☐	☐
725.242(a)	☒	☐	☐		☐	☐	☐
739.122(c)	☒	☐	☐		☐	☐	☐
809.201	☒	☐	☐		☐	☐	☐
809.301	☒	☐	☐		☐	☐	☐
809.302	☒	☐	☐		☐	☐	☐
21(f)(1)	☒	☐	☐		☐	☐	☐
21(f)(2)	☒	☐	☐		☐	☐	☐
21(i)	☒	☐	☐		☐	☐	☐
21(j)	☒	☐	☐		☐	☐	☐
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V = Violation Observed; C = Continuing; R = Resolved **NA = Not Applicable; NE = Not Evaluated**

R000104

Completed Date: 9-17-14

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

BUREAU OF LAND / FIELD OPERATIONS SECTION

RCRA INSPECTION REPORT

GENERAL FACILITY INFORMATION

USEPA ID #:	ILD982621690			BOL ID #:	0210600007
Facility Name:	THE PAINT SHOP			Phone #:	217/824-8032
Location	2301 S SPRESSER			County:	CHRISTIAN
City:	TAYLORVILLE	State:	IL	Zip Code:	62568
Region:	SPRINGFIELD	Inspection Date:	May 21, 2014	Time:	Apx. 11:00 to 12:00
Weather:	78 ° F ~ Overcast				

TYPE OF FACILITY

Notified As:	N/A	Regulated As:	G-1, TSD

TYPE OF INSPECTION

CEI: ☐	CME/O&M: ☐	CSI: ☐	NRR: ☐	CCI: ☐	PIF: ☐	CVI: ☐	CSE: ☐	CAO:
FUI to:	☐	Other: ☒						

NOTIFICATION INFORMATION (EPA 8700-12)

Notification Date:	(initial)	(subsequent)

PART A PERMIT INFORMATION (EPA 3510-3 OR EPA 8700-23)

Part A Date:	N/A	Amended:	Withdrawn:

PART B PERMIT INFORMATION

(Check one if applicable) Application Submitted? ☐	Permit Issued? ☐	Date:

ACTIVE ENFORCEMENT

Date facility referred to:	USEPA:	IAGO:	County State's Attorney:

ACTIVE ENFORCEMENT ORDERS

CACO:	CAFO:	Federal Court Order:
Consent Decree:	IPCB Order:	State Court Order:

TSD FACILITY ACTIVITY SUMMARY

Activity by Process Code	On Part A?	On Part B?	Activity ever done?	Closed?	Being done during inspection?	Exempt per 35 IAC Sec:	On Annual Report:		
S01	☐	☐	☒	☐	☒		☐	☐	☐
T04	☐	☐	☒	☐	☒		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐

OWNER / OPERATOR

OWNER				OPERATOR			
Name:	Peoples Bank & Trust, a banking corporation, as Trustee of Land Trust Agreement 3835			**Name:**	Brandis Aircraft, LLC and Evergreen Aviation, Inc.		
Address:	P.O. Box 620			**Address:**	2301 S SPRESSER		
City:	TAYLORVILLE			**City:**	TAYLORVILLE		
State:	ILLINOIS	**Zip Code:**	62568	**State:**	ILLINOIS	**Zip Code:**	62568
Phone #:	217-824-8032			**Phone #:**	217-824-8032		

PERSON(S) INTERVIEWED

PERSON(S) INTERVIEWED	TITLE	PHONE #
ROBERT BRANDIS	Operator	217-824-8032
MICHAEL BRANDIS	Operator	217-824-8032

INSPECTION PARTICIPANTS

STEVE TOWNSEND*	IEPA/BOL-DLPC-FOS	217/557-8761
PAUL EISENBRANDT	IEPA/BOL-DLPC-FOS	217/557-8761

SUMMARY OF APPARENT VIOLATIONS

AREA	SECTION	X	AREA	SECTION	X	AREA	SECTION	X
	703.121(a)	☒		725.116(a)	☒		725.242(a)	☒
	703.121(b)	☒		725.137	☒		739.122	☒
	703.150(a)	☒		725.151(a)	☒		809.201	☒
	722.134(a)	☒		722.111	☒		809.301	☒
	722.134(a)(2)	☒		808.121(a)	☒		809.302	☒
	- 725.271	☒		725.113(a)	☒	ACT	21(f)(1)	☒
	- 725.272	☒		725.113(b)	☒	ACT	21(f)(2)	☒
	- 725.273(b)	☒		725.115(a)	☒	ACT	21(i)	☒
	- 725.274	☒		725.115(b)	☒	ACT	21(j)	☒
	722.134(a)(3)	☒		725.173	☒			
	722.134(a)(4)	☒		725.212(a)	☒			

ACT = APPARENT VIOLATION OF ILLINOIS ENVIRONMENTAL PROTECTION ACT X = CONTINUING VIOLATIONS
***RTC* = RETURNED TO COMPLIANCE**

Completed Date: 9-17-14

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

BUREAU OF LAND / FIELD OPERATIONS SECTION

RCRA INSPECTION REPORT

GENERAL FACILITY INFORMATION

USEPA ID #:	ILD982621690			**BOL ID #:**	0210600007
Facility Name:	THE PAINT SHOP			**Phone #:**	217/824-8032
Location	2301 S SPRESSER			**County:**	CHRISTIAN
City:	TAYLORVILLE	**State:**	IL	**City:**	TAYLORVILLE
Region:	SPRINGFIELD	**Inspection Date:**	June 5, 2014	**Time:**	9:00 to 15:00
Weather:	72 ° F ~ Clear				

TYPE OF FACILITY

Notified As:	N/A	**Regulated As:**	G-1, TSD

TYPE OF INSPECTION

CEI: ☐	**CME/O&M:** ☐	**CSI:** ☐	**NRR:** ☐	**CCI:** ☐	**PIF:** ☐	**CVI:** ☐	**CSE:** ☐	**CAO:**
FUI to:	☐	**Other:** Sampling Split ☒						

NOTIFICATION INFORMATION (EPA 8700-12)

Notification Date:	**(initial)**	**(subsequent)**

PART A PERMIT INFORMATION (EPA 3510-3 OR EPA 8700-23)

Part A Date:	N/A	**Amended:**	**Withdrawn:**

PART B PERMIT INFORMATION

(Check one if applicable) Application Submitted? ☐	**Permit Issued?** ☐	**Date:**

ACTIVE ENFORCEMENT

Date facility referred to:	**USEPA:**	**IAGO:**	**County State's Attorney:**

ACTIVE ENFORCEMENT ORDERS

CACO:	**CAFO:**	**Federal Court Order:**
Consent Decree:	**IPCB Order:**	**State Court Order:**

TSD FACILITY ACTIVITY SUMMARY

Activity by Process Code	On Part A?	On Part B?	Activity ever done?	Closed?	Being done during inspection?	Exempt per 35 IAC Sec:	On Annual Report:		
S01	☐	☐	☒	☐	☒		☐	☐	☐
T04	☐	☐	☒	☐	☒		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐
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	☐	☐	☐	☐	☐		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐

OWNER / OPERATOR

OWNER		OPERATOR	
Name:	Peoples Bank & Trust, a banking corporation, as Trustee of Land Trust Agreement 3835	Name:	Brandis Aircraft, LLC and Evergreen Aviation, Inc.
Address:	P.O. Box 620	Address:	2301 S SPRESSER
City:	TAYLORVILLE	City:	TAYLORVILLE
State:	ILLINOIS Zip Code: 62568	State:	ILLINOIS Zip Code: 62568
Phone #:	217-824-8032	Phone #:	217-824-8032

PERSON(S) INTERVIEWED

	TITLE	PHONE #
MICHAEL BRANDIS	Operator	217-824-8032

INSPECTION PARTICIPANTS

STEVE TOWNSEND*	IEPA/BOL-DLPC-FOS	217/557-8761
PAUL EISENBRANDT	IEPA/BOL-DLPC-FOS	217/557-8761
MARK WEBER	IEPA/BOL-DLPC-FOS	217/557-8761

SUMMARY OF APPARENT VIOLATIONS

AREA	SECTION	X	AREA	SECTION	X	AREA	SECTION	X
	703.121(a)	☒		725.116(a)	☒		725.242(a)	☒
	703.121(b)	☒		725.137	☒		739.122	☒
	703.150(a)	☒		725.151(a)	☒		809.201	☒
	722.134(a)	☒		722.111	☒		809.301	☒
	722.134(a)(2)	☒		808.121(a)	☒		809.302	☒
	- 725.271	☒		725.113(a)	☒	ACT	21(f)(1)	☒
	- 725.272	☒		725.113(b)	☒	ACT	21(f)(2)	☒
	- 725.273(b)	☒		725.115(a)	☒	ACT	21(i)	☒
	- 725.274	☒		725.115(b)	☒	ACT	21(j)	☒
	722.134(a)(3)	☒		725.173	☒			
	722.134(a)(4)	☒		725.212(a)	☒			

ACT = APPARENT VIOLATION OF ILLINOIS ENVIRONMENTAL PROTECTION ACT X = CONTINUING VIOLATIONS

R000108

Completed Date: 9-17-14

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

BUREAU OF LAND / FIELD OPERATIONS SECTION

RCRA INSPECTION REPORT

GENERAL FACILITY INFORMATION

USEPA ID #:	ILD982621690			**BOL ID #:**	0210600007
Facility Name:	THE PAINT SHOP			**Phone #:**	217/824-8032
Location	2301 S SPRESSER			**County:**	CHRISTIAN
City:	TAYLORVILLE	**State:**	IL	**Zip Code:**	62568
Region:	SPRINGFIELD	**Inspection Date:**	August 11, 2014	**Time:**	
Weather:	N/A				

TYPE OF FACILITY

Notified As:	N/A	**Regulated As:**	G-1, TSD

TYPE OF INSPECTION

CEI: ☐	**CME/O&M:** ☐	**CSI:** ☐	**NRR:** ☒	**CCI:** ☐	**PIF:** ☐	**CVI:** ☐	**CSE:** ☐	**CAO:**
FUI to:	☐	**Other:**						

NOTIFICATION INFORMATION (EPA 8700-12)

Notification Date:	**(initial)**	**(subsequent)**

PART A PERMIT INFORMATION (EPA 3510-3 OR EPA 8700-23)

Part A Date: N/A	**Amended:**	**Withdrawn:**	

PART B PERMIT INFORMATION

(Check one if applicable) Application Submitted? ☐	**Permit Issued?** ☐	**Date:**

ACTIVE ENFORCEMENT

Date facility referred to:	**USEPA:**	**IAGO:**	**County State's Attorney:**

ACTIVE ENFORCEMENT ORDERS

CACO:	**CAFO:**	**Federal Court Order:**
Consent Decree:	**IPCB Order:**	**State Court Order:**

TSD FACILITY ACTIVITY SUMMARY

Activity by Process Code	On Part A?	On Part B?	Activity ever done?	Closed?	Being done during inspection?	Exempt per 35 IAC Sec:	On Annual Report:		
S01	☐	☐	☒	☐	☒		☐	☐	☐
T04	☐	☐	☒	☐	☒		☐	☐	☐
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	☐	☐	☐	☐	☐		☐	☐	☐
	☐	☐	☐	☐	☐		☐	☐	☐

OWNER / OPERATOR

OWNER		OPERATOR	
Name:	Peoples Bank & Trust, a banking corporation, as Trustee of Land Trust Agreement 3835	**Name:**	Brandis Aircraft, LLC and Evergreen Aviation, Inc.
Address:	P.O. Box 620	**Address:**	2301 S SPRESSER
City:	TAYLORVILLE	**City:**	TAYLORVILLE
State:	ILLINOIS **Zip Code:** 62568	**State:**	ILLINOIS **Zip Code:** 62568
Phone #:	217-824-8032	**Phone #:**	217-824-8032

PERSON(S) INTERVIEWED

PERSON(S) INTERVIEWED	TITLE	PHONE #
N/A		

INSPECTION PARTICIPANTS

STEVE TOWNSEND*	IEPA/BOL-DLPC-FOS	217/557-8761
PAUL EISENBRANDT	IEPA/BOL-DLPC-FOS	217/557-8761

SUMMARY OF APPARENT VIOLATIONS

AREA	SECTION	X	AREA	SECTION	X	AREA	SECTION	X
	703.121(a)	☒		725.116(a)	☒		725.242(a)	☒
	703.121(b)	☒		725.137	☒		739.122	☒
	703.150(a)	☒		725.151(a)	☒		809.201	☒
	722.134(a)	☒		722.111	☒		809.301	☒
	722.134(a)(2)	☒		808.121(a)	☒		809.302	☒
	- 725.271	☒		725.113(a)	☒	ACT	21(f)(1)	☒
	- 725.272	☒		725.113(b)	☒	ACT	21(f)(2)	☒
	- 725.273(b)	☒		725.115(a)	☒	ACT	21(i)	☒
	- 725.274	☒		725.115(b)	☒	ACT	21(j)	☒
	722.134(a)(3)	☒		725.173	☒			
	722.134(a)(4)	☒		725.212(a)	☒			

ACT = APPARENT VIOLATION OF ILLINOIS ENVIRONMENTAL PROTECTION ACT **X** = CONTINUING VIOLATIONS
RTC = RETURNED TO COMPLIANCE

IEPA - BOL/FOS MEMORANDUM

DATE: **August 14, 2014**

TO: **DLPC/Division File**

FROM: **S. Townsend, DLPC/FOS - Springfield Region**

SUBJECT: **LPC # 0210600007– Christian County**
Taylorville/The Paint Shop
ILD982621690
FOS FILE

and

LPC # 0210605081– Christian County
Taylorville/Evergreen Aviation
FOS FILE

RECEIVED
SEP 1 9 2014
IEPA/BOL

Narrative:

A complaint was received that wastes from one or both of these above referenced facilities located at 2301 S. Spresser Street in Taylorville, IL, were being transported in a 1980's era El Camino with the license plate LEERJET B to a local car wash and were being improperly disposed by Robert Brandis. An inspection was planned to determine the facilities' waste generation and handling procedures.

On May 16, 2014, Steve Townsend and Paul Eisenbrandt of the Illinois Environmental Protection Agency (IEPA) conducted an inspection of the above referenced facilities. In addition to asking about the specific allegations in the complaint, a RCRA Compliance Evaluation Inspection (CEI) format was followed to determine waste generation, and handling, including any waste storage, treatment, and disposal done at or by these facilities. Michael and Robert Brandis were both interviewed during the May 16, 2014, inspection. Michael Brandis answered most of the questions about the operations in the south hangar (Evergreen Aviation - 0210605081) and Robert Brandis answered most of the questions about operations in the north hangar (The Paint Shop - 0210600007) as described below. Robert Brandis was also asked about the transport and dumping of waste at the car wash. Not all of the wastes generated by the aircraft painting operations could be accounted for through waste disposal records. A brief second site visit was done on May 21, 2014, and wastes were sampled in the Paint Shop (north hangar - 0210600007) on June 5, 2014 as described in item 9C below.

Products, Processes and Services

Brandis Aircraft - Evergreen Aviation was described by Michael Brandis as a repair/service shop which services, tests, and repairs the mechanical parts of aircraft in the south hangar. The following processes/services are done on-site in the south hangar.

A. **Aircraft Disassembly and Inspection** – Aircraft are partially disassembled to allow servicing and inspection per FAA requirements. Parts such as engines are pulled and transported off site where they are rebuilt prior to being re-installed. Parts washing, and cleaning using a bead blaster are done (see photos 0210605081-05162014-006 and 007). Bead blast waste is not yet generated. Fuel is temporarily placed in tanks and then refilled into aircraft once servicing/inspecting is done according to the site operators. Testing of hydraulic systems is also done as part of servicing and repair of aircraft (see photo 0210605081-05162014-005).

B. **Refurbish Aircraft Interiors** – Aircraft interiors are refurbished per customer requests. The seating and other padded parts to be refurbished are removed and sent to an off-site business where they are reupholstered. Similarly "wood" items, which are actually thin veneers over a lighter material, are also refinished off-site. Electronics and other interior parts, including mechanical parts are removed and replaced as needed.

C. **Tire Replacement** – Tires are removed and replaced.

D. **Mechanical Part Replacement** – Electronics, lead acid batteries (see photo 0210605081-05162014-004), and other parts, including mechanical parts, are removed and replaced as needed.

E. **Some Masking, Paint Preparation** – Some masking and wiping of Aircraft with Methyl Ethyl Keytone (MEK) using shop rags was being done in the Evergreen Aviation Hangar (see photos 0210605081-05162014-008 and 009).

Brandis Aircraft - The Paint Shop was described by the operators as an aircraft de-painting and coating shop located in the north hangar. The following processes/services are done on-site in the north hangar.

F. **Aircraft De-painting** – Aircraft de-painting via a chemical stripper is done on-site. A Methylene Chloride and acid based stripper gel is applied to aircraft to react with and loosen paint (see Attachment A).

G. **Aircraft Rinsing** – Using water and treated rinse water, stripper is "rinsed" off of aircraft with loosened paint. The loosened stripper is dropped onto plastic sheathing on the hangar floor. The rinse water with some stripper is sprayed on the plane to remove the remaining paint/stripper and is flushed into a floor trough said to be self-contained.

H. **Stripper/Waste Water Treatment** – According to Robert J. Brandis the spent rinse water with stripper is run through a water purification system/solvent stripper (see Attachment B) to treat the waste and "reclaim" the water for reuse.

I. **Masking** – Masking of parts prior to painting is done in the north hangar.

J. **Paint Preparation** - Aircraft are wiped down with MEK as a surface preparation for painting.

K. **Painting** – Aircraft are painted with an epoxy type aircraft paint which reacts and creates a skin over the aircraft.

L. **Paint Clean-up** – Clean up from painting is done on-site using a small pail with solvent. Some becomes part of the waste paint solids and some is hardened paint which is disposed of as general refuse (see item 8 below).

The following additional processes were said to occur in either hangar, not in a hangar on-site, or in the office shared by Evergreen Aviation, The Paint Shop and Brandis Aircraft. These processes will be referred to as done by **Brandis Aircraft, LLC**.

M. **Replace PC's** – Though computer replacement rarely occurs, when it does the computers are recycled through BLH Computers in Taylorville.

N. **Replace Facility Lighting** – Spent fluorescent lights had not been generated for some time. They had previously been disposed as general refuse. Michael Brandis requested information about handling fluorescent lights as universal wastes.

O. **Washing out of drums** – Drums used by the Paint Shop, which may or may not have contained a listed hazardous waste prior to rinsing, were taken off-site to the Magic Wand Car Wash located on N. Houston, in Taylorville, Illinois according to Robert Brandis, where they were rinsed out prior to being used as part of a boat dock. The complaint alleged full drums were taken to the Magic Wand Car Wash and the contents were disposed there.

P. **Disposal of the Contents of the Carboy Type Containers** – Three mostly empty blue carboy type containers were seen on-site on May 16, 2014 near the shed north of the Paint Shop hangar. Identical carboys were photographed on May 2, 2014, by the Taylorville Police Department in the back of an El Camino seen on-site. On May 16, 2014, Mr. Robert Brandis stated the carboys had contained waste water from an RV camper seen on-site. He later said that they had used some aluminum cleaner on the camper and accumulated that liquid in the carboys. According to Robert Brandis the fluid from the camper was disposed of at the car wash. The carboys were not seen on May 21, 2014, or June 5, 2014. The location of the carboys was said to be unknown to Michael Brandis on June 5, 2014. Mr. Robert Brandis was not on-site on June 5, 2014 during our sampling inspection.

Q. **Washing Interior Floors** – Floors are cleaned on-site as needed. Zep floor cleaner is used inside a cleaning machine (see photo 0210605081-05162014-003). No waste is known to be generated by this process.

Waste Generation, Accumulation and Disposition.

Wastes generated in the south hangar -- Brandis Aircraft - Evergreen Aviation, Inc.

A. **Aviation Fuel** - Aviation fuel is removed from planes when they are serviced or repaired. According to the site operators this is placed in a container and the put back in the planes once the work is completed. The removed fuel is reused as raw material fuel and not handled as waste (see photo 0210605081-05162014-010).

B. **Used oil** - Small amounts of used oil are generated from the aircraft. According to site operators the oil is accumulated with the used oil from the airport. Used hydraulic oil was also seen from testing with the mule hydraulic testing machine (see photo 0210605081-05162014-005). Used oil was seen accumulated in two drums in the south hangar storage room (see photos 0210605081-05162014-001 and 002). Small amounts (less than 10 gallons) of spent waste spent mineral spirits solvent from the parts washer are also added to the used oil (see photo 0210605081~05162014-006). According to Michael Brandis this combined waste is handled as used oil by Safety-Kleen. The last manifested shipment of used oil listed Brandis Aircraft as the generator. The last manifested shipment of used oil was sent off-site on October 25, 2011, and the shipping certification was signed by Michael Brandis (see Attachment D).

C. **Mechanical Parts** - Some parts are waste general refuse, some are recyclable and some are turned in per FAA requirements for testing. None are handled as special or hazardous special wastes.

D. **Tires** – Used tires are taken to Larry's Service Center (See Attachment E) in Taylorville.

E. **Used rags** – rags are used to wipe MEK on the planes as a cleaner/prep prior to painting at the Paint Shop. Rags are also used to wipe parts in general cleaning. The rags are placed in a mesh type bag and are then laundered (see photo 0210605081~05162014-008 and 009). New rules apply to such rag use (see 35 IAC Section 721.104(a)(26)).

F. **Used Batteries – Exempt** - Used lead acid batteries are returned to the manufacturer via a supplier.

Wastes generated in the north hangar -- Brandis Aircraft -The Paint Shop.

G. **Waste Stripper – (F002, D002)** – The raw material stripper used on-site contains 67 to 77% Methylene Chloride (see Attachment A). As such, spent stripper generated from use of a raw material stripper containing more than 10% Methylene Chloride before use is a listed hazardous waste (F002). The stripper also contains Formic acid. Stripper is applied to planes to de-paint them. Used stripper and loosened paint are removed from the planes by scraping and rinsing. Scraped off waste stripper ends up on plastic sheets on the floor of the north hangar. Stripper is also washed off the plane and into a floor trough with a holding (sump) pit. At one time waste solids from treating rinse water and waste solids removed from plastic sheets on the floor were disposed of as D002 – Corrosive hazardous waste (see Attachment G). These wastes are also listed hazardous waste (F002) but were not identified as such by Robert or Michael Brandis. Any spent stripper wastes derived from use of a raw material containing more than 10% methylene would be a listed hazardous waste (F002 - see item 8 below).

H. **Waste Rinse-water with Stripper and paint - (F002)** – Spent rinse-water with stripper and paint is said to be pumped from the sump pits (see photos 0210600007~05162014-004 and 005) into 55 gallon plastic drums. Drums with such waste in them were found on-site (see photo 0210600007~05162014-002). The rinse-water contains a spent stripper which before use contained more than 10% Methylene Chloride. As such, this is a listed hazardous waste (F002). Treatment of such waste is hazardous waste treatment and disposal of such waste is hazardous waste disposal. This waste was said to be treated by putting the contents of the drums through a Kwick Kleen water purification system (see photo 0210600007~05162014-007). This process was said to remove the volatiles, and filter out the solids. The treatment unit has no Illinois EPA Air Pollution Control or RCRA permit (see item 8 below). The system appeared to be dry and unused during the May 16, 2014 inspection. Mr. Robert Brandis stated the facility does use the system to treat its waste rinse water (see Item 4 Unusual Events, and comments below).

I. **Waste plastic Sheets – Undetermined** - Plastic sheets are put under the plane to catch solids including Methylene Chloride based stripper and removed paint. According to Robert Brandis this waste plastic was gathered into bags and allowed to dry (see photo 0210600007~05162014-006). The solids were said to be removed and placed in the waste paint/stripper solids drum and the plastic sheets were disposed of as general refuse according to Robert Brandis.

J. **Waste Paint related materials – Undetermined** - The waste from painting is accumulated in small pails or buckets. The waste solidifies and is disposed of as general refuse (see photos 0210600007~06052014-028 and 029, and item 8 below).

K. **Spent Paint Booth Filters – Undetermined** – Paint booth filters are used in the hangar where planes are painted. These filters are changed as needed (see photo 0210600007~05162014-003). The filters were said to be disposed of as general refuse.

L. **Waste Masking Agents – General Refuse** - Masking materials placed on parts of the planes to prevent paint adherence are removed from the planes once painted and disposed of as general refuse.

Wastes generated by facility and office maintenance and/or not in a hangar - Brandis Aircraft, LLC
These wastes are generated by the office shared by the Paint Shop and Evergreen Aviation, Inc., or were generated on-site but not associated wholly with one shop or the other.

M. **Used PC's – Recycled PCs** - When generated, used PC's are recycled through BLH Computers in Taylorville, Illinois.

N. **Spent Fluorescent Bulbs – Undetermined** – Spent bulbs had been placed in the general refuse previously. Michael Brandis requested information on how to handle such waste as universal wastes for when bulbs are generated next time.

O. **Used Plastic Drums and Any Residue or Contents of Such Drums – Undetermined** – According to Robert Brandis plastic drums like the ones used to accumulate rinse-water with spent Methylene Chloride stripper and paint solids were taken to the aforementioned car wash as empties and rinsed out so they could be used to construct a boat dock off-site. Drums were seen by the Taylorville Police Department in the back of an El Camino matching the vehicle seen outside the Paint Shop and Evergreen Aviation (see items 4B and 6B below and Attachment C).

P. **Contents of Carboys – Undetermined** – According to Robert Brandis, blue plastic carboys seen during the May 16, 2014 inspection were used to accumulate waste water from an RV camper stored on-site. Later Mr. Robert Brandis claimed that an aluminum cleaner had been used on the camper and rinsed off, which was also placed in the carboys, and this was part of the waste taken to the aforementioned car wash for disposal. The contents of these carboys appear to have been generated on-site. No waste determination was made on the contents prior to disposal at the car wash. No explanation why the camper's wastewater was not emptied at a campground waste station or driven directly to a sewer discharge point was given to these inspectors. These carboys were seen by the Taylorville Police Department in the back of an El Camino matching the vehicle seen outside the Paint Shop and Evergreen Aviation (see items 4B, 6B, 8, and 9 below and Attachment C).

Unusual Events, Occurrences, or Application of the Regulations

A. Robert and Michael Brandis stated that the mechanical repair portion referred to as Evergreen Aviation (0210605081), and the aircraft coating operation referred to as the Paint Shop (0210600007) are separate entities. These operations share an office in the south hangar. When reviewing paperwork from the operations conducted in the two hangars, the line between these businesses was not clear. Manifest number 004874712 JJK (see Attachment E and photo 0210600007~05162014-001), which accompanied the last hazardous waste shipment from the north hangar (The Paint Shop), lists the generator as Evergreen Aviation, but uses the USEPA ID number ILD982621690 of the Paint Shop, which was initially assigned to Brandis Aircraft. Evergreen Aviation has no USEPA ID number. Manifest 004874712 JJK was signed by Robert J. Brandis, the Paint Shop operator. The wastes shipped were "Waste Formic Acid," the term used by Robert Brandis to describe paint stripper used in the Paint Shop but not used in the south hangar (Evergreen Aviation).

The deed for the property where the hangar said to be the Paint Shop is located lists Peoples Bank & Trust, a banking Corporation, as Trustee of Land Trust Agreement 3835 dated November 7, 2012 as the owner. The tax bill is sent to Robert J. Brandis and Michael J. Brandis. Adjacent properties are deeded to Evergreen Aviation, Inc. including the south hangar said to be Evergreen Aviation. Used oil, said to be generated by Evergreen Aviation, Inc. was last sent off-site under the name Brandis Aircraft, signed by Michael Brandis, using site number 0210605081, the site number for Evergreen Aviation. On-line searches for both aircraft painting and aircraft servicing in Taylorville, Illinois, yielded only results for Brandis Aircraft, and none for either Evergreen Aviation or The Paint Shop. There does not seem to be a distinction made between the businesses in their own paperwork. The latest Illinois Secretary of State Corporation File Detail Report for Brandis Aircraft, LLC uses the office address used by both the Paint Shop and Evergreen Aviation. There are no current corporations in Illinois listed as either Evergreen Aviation or the Paint Shop, and no such businesses were found to have used a Taylorville address.

B. Complaints were received (see Attachment C) that wastes from one or both of these facilities were being transported in a 1980's era El Camino with the license plate LEERJET B. The Taylorville police department informed the IEPA that it had seen this vehicle with plastic drums in the bed weighted down (riding as if a significant weight was in the bed) entering the Magic Wand Car Wash in Taylorville and later leaving the car wash without weight in the back end (the back end was no longer lowered) but the drums were still in the bed. Two El-Caminos were found on-site with empty beds (see photos 0210600007~05162014-008 and 009). Mr. Robert Brandis confirmed that drums had been transported to the car wash but stated that the drums were empty drums and were rinsed at the car wash so they could be used to construct a boat dock off-site. There was no indication why such drums were not rinsed or washed off on-site rather than at a car wash. The description of the drums being empty does not match the police description of the weighed down vehicle being driven to the car wash. Per his own admission, it was learned that Robert Brandis did dispose of some wastes at a local car wash in carboys. The type of waste disposed, according to Mr. Robert Brandis, was wastewater from an RV camper and a cleaner/aluminum brightener used on the camper.

C. Not all hazardous wastes which would have been expected to be generated by this facility since the last manifested shipment of hazardous waste in 2010 can be accounted for. At eight to nine planes per year (Robert Brandis said a plane is done approximately every six weeks) the volume of paint solids removed alone would equal 8 to 42.21 gallons per year based on the number of gallons of paint used to paint a plane (3 to 7 gallons per Robert Brandis) multiplied by the percent solids in aircraft paints (33% to 67% typically found in aircraft paints or 1 gal to 4.69 gal solids). According to Robert Brandis the volume of stripper gel applied to an aircraft would range from 18 gallons per small plane to up to 33 gallons on a larger jet like a Falcon. The USEPA estimates that 80% of the Methylene Chloride applied to an aircraft for paint stripping will evaporates and 20% will remain in the waste stripper/rinsate with stripper (see Attachment Q). The stripper used by the Paint Shop (0210600007) contained up to 77% Methylene Chloride (see Attachment A). Accounting for an up to 61.6% reduction (80% of 77%) due to volatilization, this would add between 6.91 gallons to 12.67 gallons of listed hazardous waste stripper residue to the paint solids per plane. The solids from only one plane de-painting would generate a total of 7.91 gal to 17.36 gal of listed hazardous waste paint plus stripper residue). The plane in the hangar was a Falcon (large plane), and 20 drums of rinse water with an estimated 17.36 gallons total solids were on-site. This would mean a dilution rate of 63.2 gallons of water to 1 gallon of paint solids and stripper is present in the waste generated by stripping and rinsing the Falcon. At 8 to 9 planes per year, Brandis Aircraft would be expected to generate about 63.28 gallons solids painting 8 small planes ((1gal paint solids + 6.91stripper solids) x 8 planes = 63.28 gallons). If 9 large planes are painted about 156 gallons per year solids would be generated ((4.69 paint solids + 12.67 stripper solids) x 9 planes = 156.24 gallons solids). This facility only provided documentation for the proper disposal of 55 gallons of paint/stripper solids for the last 4 and 1/3 years rather than the expected 272 gallons (4.3 x 63.28 gal or 4.9 55-gal drums) to 671 gallons (4.3 x 156 gal or 12.2 55-gal drums) of solids that would have been expect to be generated from January 2010 to May 2014. These numbers account for the maximum percentage (77%) of the Methylene Chloride in the stripper and all figures are rounded down when calculations are made to simplify calculations (i.e., 63 gal is used instead of 63.28 gal). In addition to that, there was no documented accounting for the volume of additional listed hazardous waste liquids generated when spent stripper and paint solids are mixed with rinse water. All the hazardous wastes which should have been generated by plane de-painting and coating operations from 2010 to 2014 has not been accounted for. Some hazardous wastes were said to be treated on-site and reused. These would only be liquid portions of the waste (solids removed). No documented amounts of wastes treated were provided to these inspectors. The treatment itself requires an Illinois EPA Bureau of Air and RCRA permits which this facility does not have.

D. During the inspection on May 16, 2014, documents describing the stripper used to de-paint aircraft indicated that the stripper was not just an acid based stripper as described by Robert Brandis. The stripper contains mostly Methylene Chloride with some Formic Acid.

E. We took some pH readings of waste in containers and residue in the carboys using pH paper on May 16, 2014, and later returned and collected samples on June 5, 2014, to get an accurate assessment of the wastes generated on-site. The pH results are listed in a table (see Attachment H) and sample results from both IEPA and Andrews Engineering (Teklab) are attached (see Attachments I and K). The sample results indicate high levels of Methylene Chloride in all samples except X211, which was a paint waste sample.

F. During the inspection on May 16, 2014, air monitoring was conducted using a PPB Rae photoionization detector. Readings for both background and near the drums and drum head space during pH reading were taken. The "head space" of the carboys was also taken and was recorded in a table (see Attachment H).

G. During the May 16, 2014, inspection Robert Brandis arranged for sampling of the wastes in the Paint Shop to be done on May 30, 2014. Following the inspection it was learned that the contractor Robert Brandis arranged to use to collect the samples was not going to do the sampling. Andrews Engineering, Inc. was then hired to sample the wastes and the sampling date was moved. The sampling was conducted on June 5, 2014.

Regulatory Status of Brandis Aircraft, LLC, the Paint Shop, and Evergreen Aviation, Inc.

Stripping and Painting of Aircraft is done in the north hangar in the building operators referred to as the Paint Shop. This stripper used contains more than 10% Methylene Chloride before use making any waste derived from use of this material a listed hazardous waste. The one aircraft being done at the time of the inspection generated more than 20 drums of hazardous waste according to Robert Brandis. This is more than 8800 pounds of hazardous waste generated during a 6 week period. In addition, small amounts of spent solvent are also generated. This facility is therefore a large quantity generator of hazardous waste. It is assumed no more than one plane would be done per month making the hazardous waste generation rate at this facility greater than 2200 pounds in a month. As such the generation rate for this facility is that of a large quantity generator. This facility was not in compliance with the regulations for this type of generator (see item 8 below), and did not qualify for the permit exemption of 35 IAC 722.134(a), and would therefore be a Storage facility in need of a RCRA permit. In addition Robert Brandis claimed they actually treated listed hazardous waste on-site using the Kwick Kleen Water Purification System in the north hangar. Such treatment would need BOA and RCRA treatment facility permits.

As such the activities in the north hangar make the this facility subject to permitting as RCRA hazardous waste treatment facility, a hazardous waste storage facility and Large Quantity Generator of Hazardous Waste.

Attachments

A. Copy of Paint Stripper Material Safety Data Sheet (MSDS) - This attachment includes a copy of the MSDS for Kwick Kleen Paint Remover 945, the stripper used to de-paint planes in the north hangar. This attachment includes 2 pages of information.

B. Copy of Kwick Kleen Water Purification System Information – This attachment includes copies of information about the Kwick Kleen water purification system like the one found in the north hangar.

This is the system the site operators claimed to use to treat hazardous spent rinse water on-site. This attachment includes documents emailed to Paul Eisenbrandt from Restorco, Inc. This attachment includes 24 pages of information including email cover pages and 1 cover page.

C. Copy of Complaint C-14-104-C - This attachment includes copies of Complaint C-14-104-C, including a photo of carboys in the back of an El Camino. This attachment includes 11 pages of information.

D. Used Oil E-Receipt – This attachment includes copies of documentation of a used oil pick up on October 25, 2011. This is apparently the last used oil pick up. This attachment includes 2 pages of information and 1 email cover page.

E. Copy of used tire Receipt - This attachment is a used tire receipt from Larry's Service Center dated "4-18-16". This attachment includes 1 page of information and 1 email cover page.

F. Copy of New Solvent Contaminated Wipes Rule - This attachment includes a copy of 35 IAC Section 721.104(a)(26).

G. Copy of Manifest - This attachment includes a copy of Manifest 004874712 JJK used to ship what this facility described as Waste Formic Acid to Pollution Control Industries on January 4, 2010. This attachment includes two (2) pages. The manifest was light but readable. The photocopy of this manifest was not legible so a photograph of the manifest was taken (see photo 0210600007~05162014-001).

H. Waste Table - This attachment includes a table with pH readings, air monitoring (container headspace), and sample information for samples collected on June 5, 2014. This attachment includes 1 page of information.

I. Final IEPA Sample Results - This attachment includes final sample analytical results of split samples collected on June 5, 2014. This attachment includes 49 pages of information.

J. Drum Log - This attachment includes data from field observations in the form of typed drum logs for wastes sampled in the Paint Shop hangar (0210600007) on June 5, 2014. This attachment includes 11 pages of information and 1 cover page for a total of 12 pages. This attachment also describes photos taken on June 5, 2014.

K. Andrews Engineering Sample Results - This attachment includes final sample analytical results from samples collected by Andrews Engineering on June 5, 2014, analyzed by Teklab, a chain of custody, and an Email cover sheet. This attachment includes 17 pages.

L. IEPA Sampling and Safety Plan - This attachment includes a copy of the sampling and safety plan developed by the IEPA for sampling conducted on June 5, 2014. This attachment includes 25 pages of information.

M. Andrews Engineering Sampling Safety Plan - This attachment includes a copy of the sampling safety plan developed by Andrews Engineering for sampling conducted on June 5, 2014..

N. Copy of DX503 Aluminum Conditioner Safety Data Sheet (MSDS) - This attachment includes a copy of the MSDS for DX503 Aluminum Conditioner from PPG, used to prep planes for painting in the north hangar. This attachment includes 7 pages of information.

O. Property Records - This attachment includes copies of Deeds, and parcel information from the Christian County GIS website, and emails from Joe Stepping, Christian County Solid Waste, transmitting the deeds to IEPA. This attachment includes 37 pages.

P. Business Records -This attachment includes copies of corporate records associated with Brandis Aircraft, LLC and Evergreen Aviation, Inc. No such records were found for "The Paint Shop." This attachment includes 5 pages of information.

Comments

A. On May 16, 2014, site photographs were also taken by Paul Eisenbrandt (see attached photos).

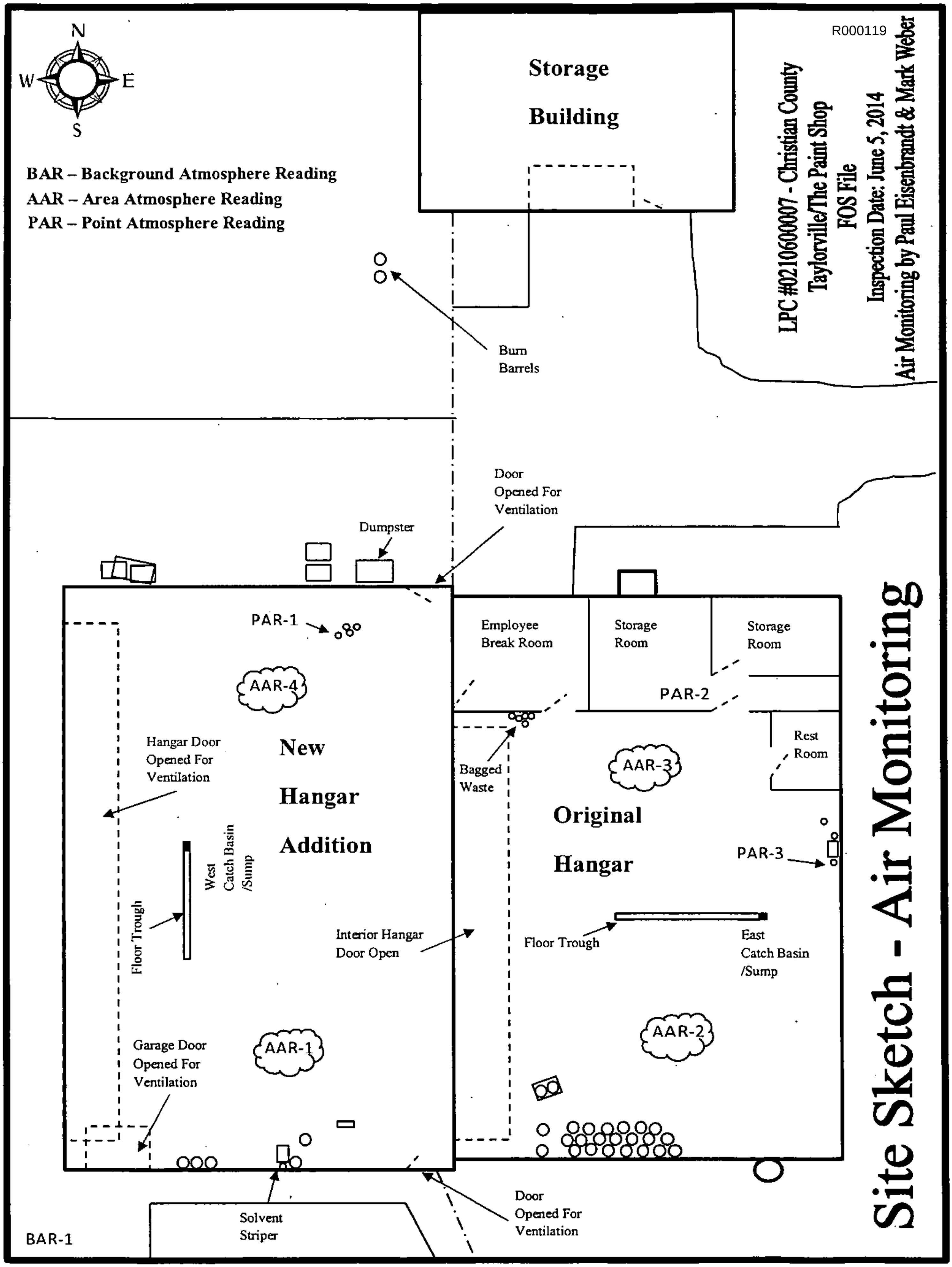
B. On May 21, 2014, Steve Townsend and Paul Eisenbrandt of the Illinois Environmental Protection Agency (IEPA) briefly stopped in and discussed the upcoming sampling and checked the site conditions at the Paint Shop. Photographs were taken during this inspection visit by Paul Eisenbrandt (see attached photos).

C. Waste sampling was conducted by Andrews Engineering, Inc., on June 5, 2014. Split samples were collected by the IEPA. Mark Weber, also of the IEPA, participated in the sampling conducted on June 5, 2014. Upon arrival on June 5, 2014, IEPA personnel requested that the Paint Shop doors, including the hangar door, be opened and remain open during the sampling to ventilate the north hangar (see photo 0210600007-06052014-001 and 002) which smelled heavily of solvent. Screening of drums and the sumps was done prior to sampling (see photo 0210600007-06052014-017). Drums were marked and staged to allow easier access (see photo 0210600007-06052014-006). Samples were collected and split sample containers from the IEPA were taken to and from the sample location by Mark Weber, IEPA. A total of 11 split samples were collected (see photos 0210600007~06052014 001 through 030 and Attachments L, and M). The sample results confirmed that rinse water and paint solids were hazardous wastes (see Attachments I, and K).

D. A record review was also conducted on August 11, 2014. At this time records obtained prior to, during and following the inspection were reviewed, as well as sample results from samples taken during the June 5, 2014 inspection.

E. Apparent violations noted as a result of the inspections and record review are noted in the attached Violation Notices.

cc: DLPC/FOS - Springfield Region



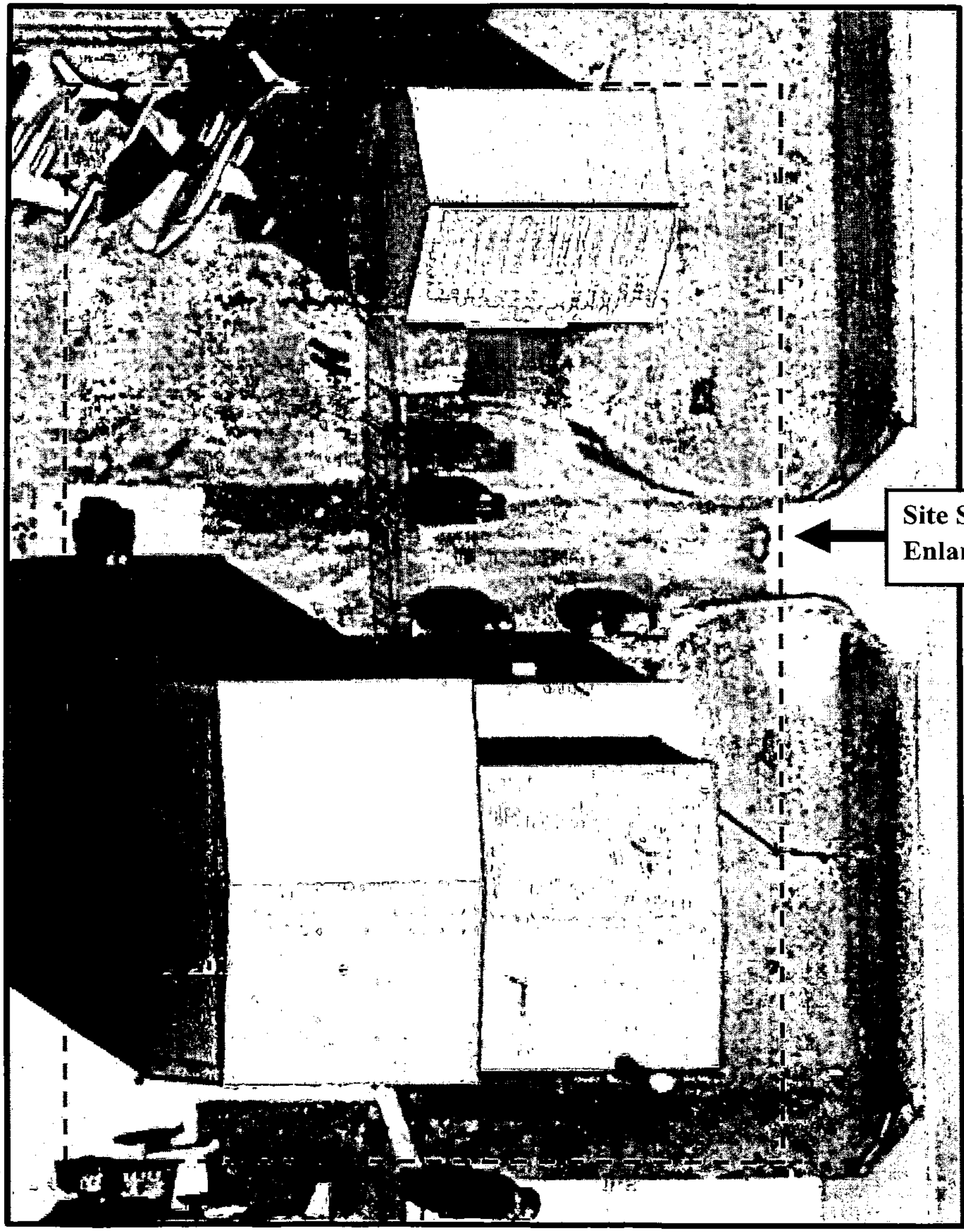
Not to Scale
Direction of Photograph
Measurements Approximate

R000120

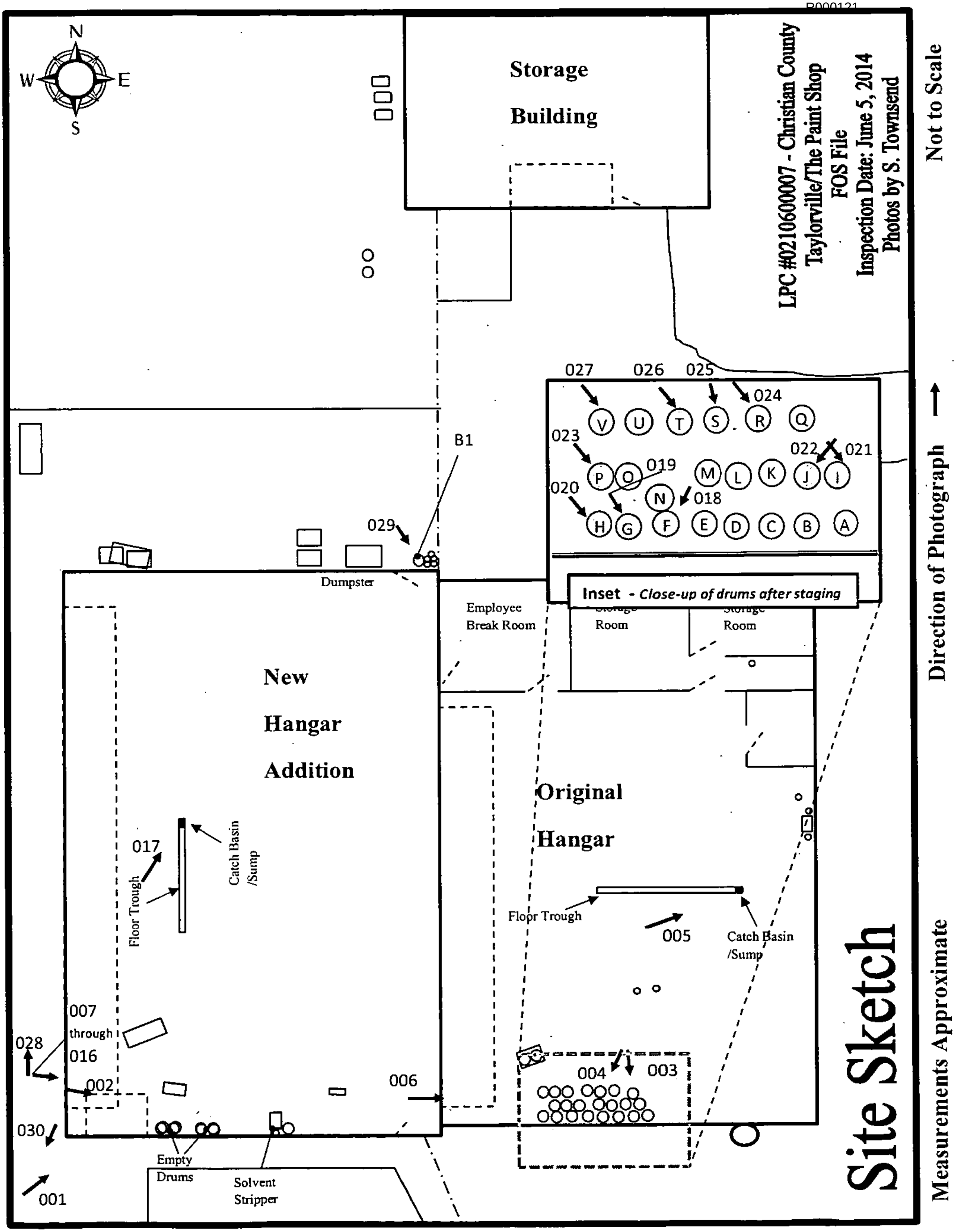
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

Aerial Image

LPC #0210600007 - Christian County
Taylorville/The Paint Shop
FOS File
Inspection Date: June 5, 2014



B000121



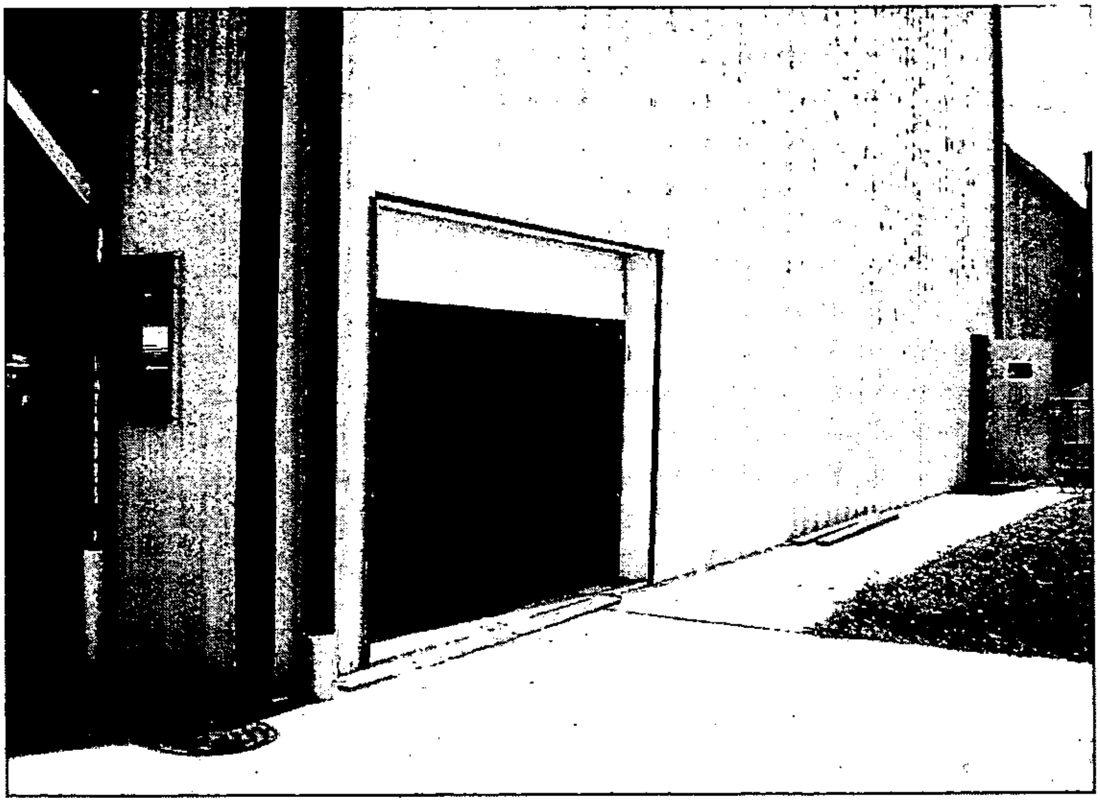
LPC #0210600007 - Christian County
Taylorville/The Paint Shop
FOS File
Inspection Date: June 5, 2014
Photos by S. Townsend
Not to Scale
Direction of Photograph
Measurements Approximate
Site Sketch
N
E
S
W
Storage Building
Inset - Close-up of drums after staging
027
026
025
024
023
022
021
020
019
018
029
B1
Dumpster
Employee Break Room
Storage Room
Storage Room
New Hangar Addition
Original Hangar
Floor Trough
Catch Basin /Sump
017
Floor Trough
Catch Basin /Sump
005
007 through 016
028
002
006
004
003
030
001
Empty Drums
Solvent Stripper

Illinois Environmental Protection Agency
Bureau of Land
Division of Land Pollution Control

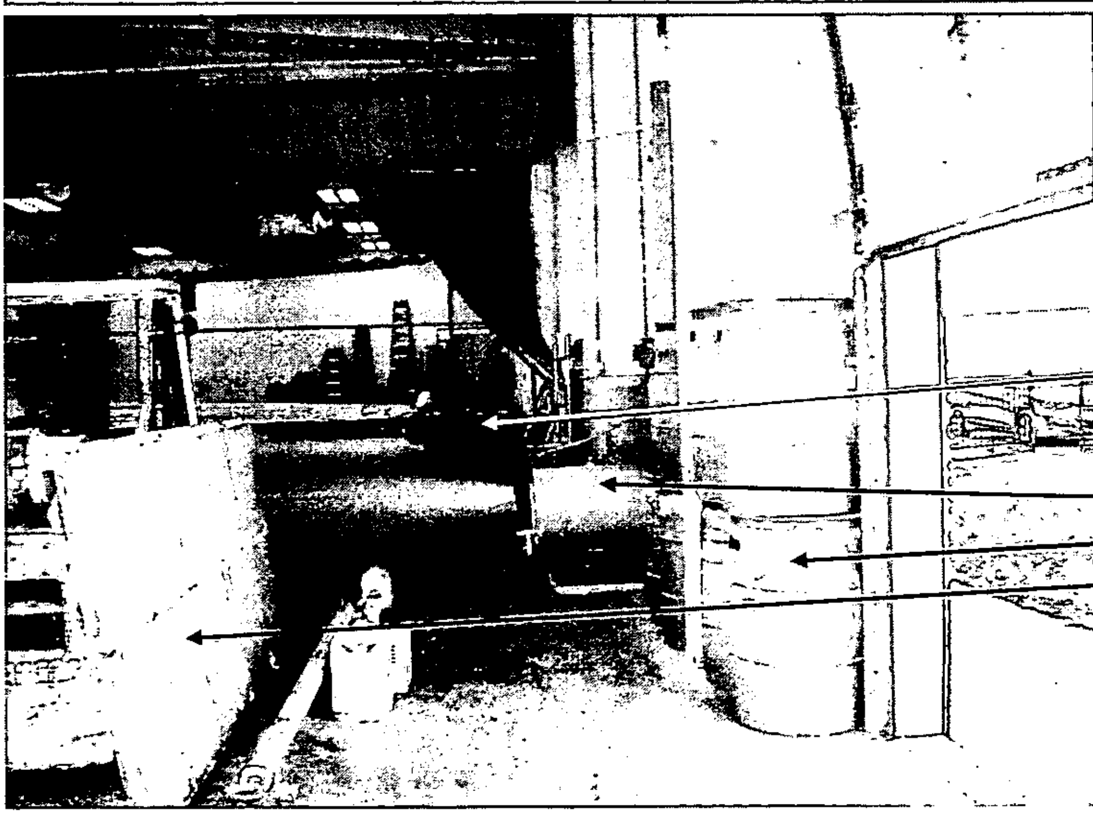
LPC # 0210600007 – Christian County
Taylorville/The Paint Shop
FOS File

DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg



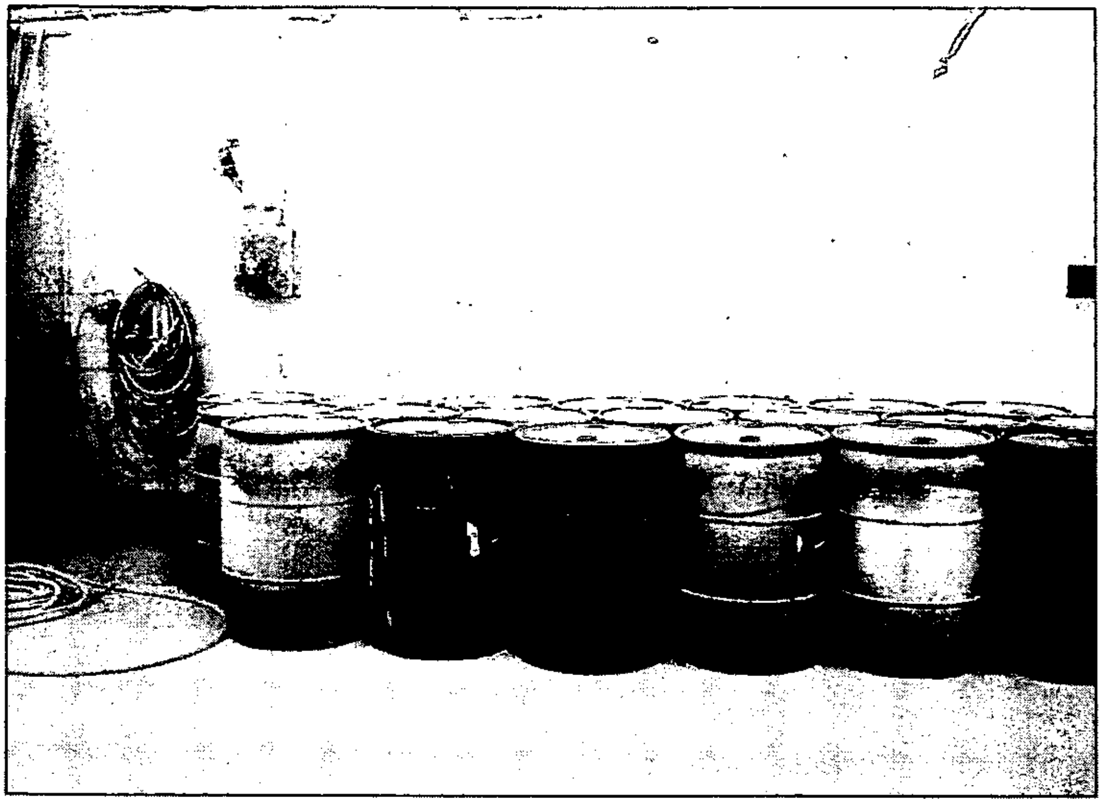
Date: June 5, 2014
Time: 9:30
Direction: NE
Photo by: S. Townsend
Exposure #: 001
Comments:
South door of Paint Shop opened for ventilation prior to sampling.



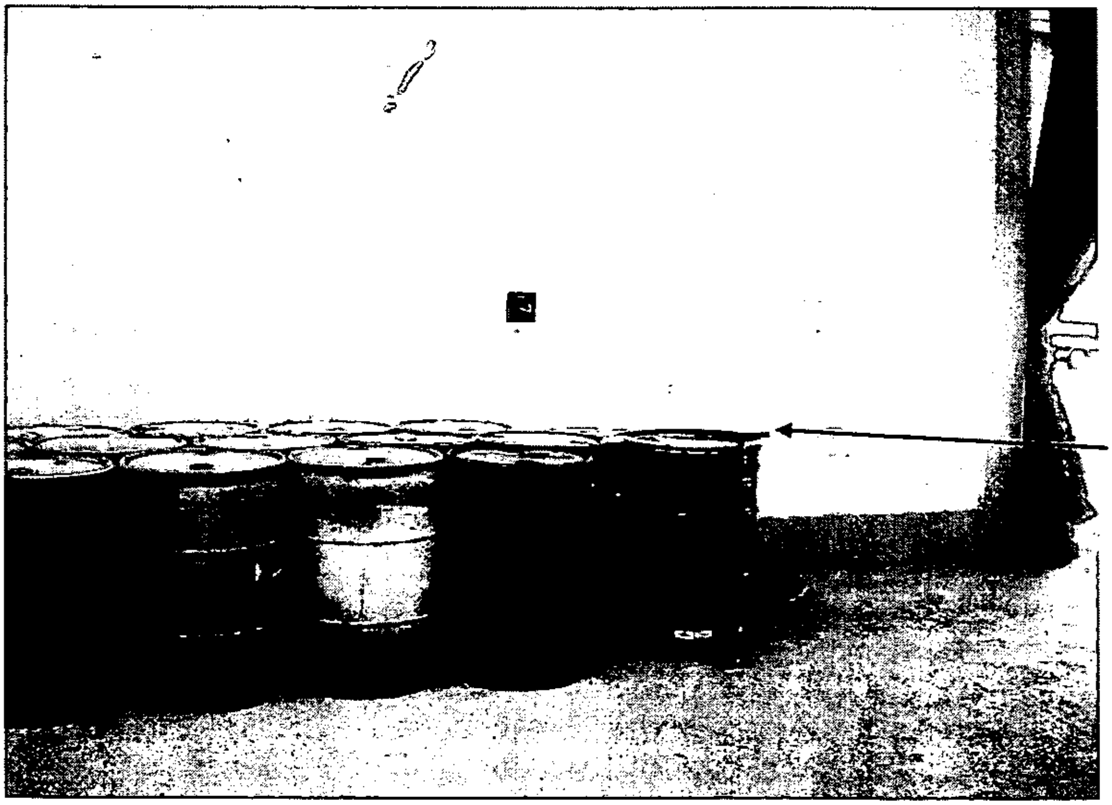
Date: June 5, 2014
Time: 9:33
Direction: E
Photo by: S. Townsend
Exposure #: 002
Comments:
View from west (hangar) opened door showing drums containing waste to be sampled, Kwik Kleen TM Waste-Water Treatment, empty drums, and paint booth filter.

DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg



Date: June 5, 2014
Time: 10:36
Direction: S-SE
Photo by: S. Townsend
Exposure #: 003
Comments:
Drums containing wastes prior to marking and sampling.

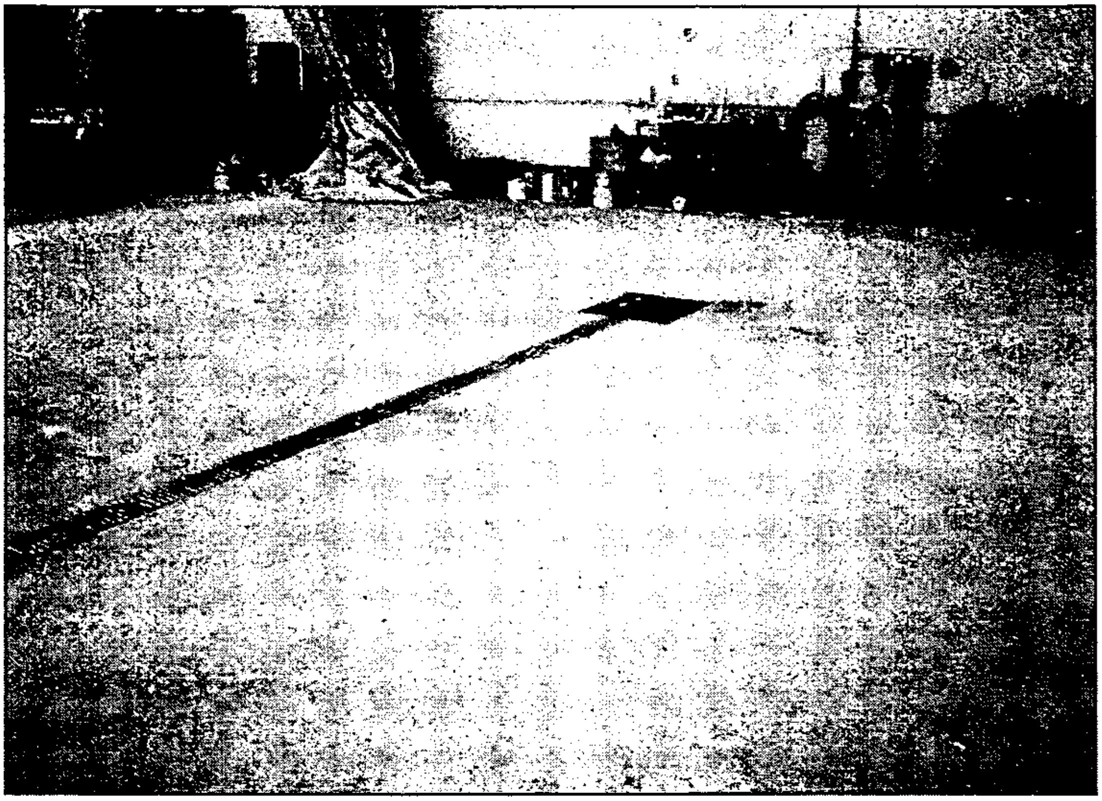


Date: June 5, 2014
Time: 10:36
Direction: S-SW
Photo by: S. Townsend
Exposure #: 004
Comments:
Drums containing wastes prior to marking and sampling.

Drum caddy.

DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg



Date: June 5, 2014
Time: 10:36
Direction: NE
Photo by: S. Townsend
Exposure #: 005
Comments:
East floor trough and sump was found to be dry.

Date: June 5, 2014
Time: 10:54
Direction: E
Photo by: S. Townsend
Exposure #: 006
Comments:
Marking and staging drums prior to sampling.

DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg

Date: June 5, 2014
Time: 12:03
Direction: E
Photo by: S. Townsend
Exposure #: 007
Comments:
IEPA split sample X201 taken from drum F.

Date: June 5, 2014
Time: 12:13
Direction: E
Photo by: S. Townsend
Exposure #: 008
Comments:
IEPA split sample X202 taken from drum G.

DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg

Date: June 5, 2014
Time: 12:29
Direction: E
Photo by: S. Townsend
Exposure #: 009
Comments:
IEPA split sample X204 taken from drum I.

Date: June 5, 2014
Time: 12:45
Direction: E
Photo by: S. Townsend
Exposure #: 010
Comments:
IEPA split sample X203 taken from drum H.

DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg

Date: June 5, 2014
Time: 12:51
Direction: E
Photo by: S. Townsend
Exposure #: 011
Comments:
IEPA split sample X205 taken from drum J.

Date: June 5, 2014
Time: 13:15
Direction: E
Photo by: S. Townsend
Exposure #: 012
Comments:
IEPA split sample X206 taken from drum P.

IR000128

DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg

Date: June 5, 2014
Time: 13:23
Direction: E
Photo by: S. Townsend
Exposure #: 013
Comments:
IEPA split sample X207 taken from drum R.

Date: June 5, 2014
Time: 13:34
Direction: E
Photo by: S. Townsend
Exposure #: 014
Comments:
IEPA split sample X208 taken from drum S.

DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg

Date: June 5, 2014
Time: 13:43
Direction: E
Photo by: S. Townsend
Exposure #: 015
Comments:
IEPA split sample X209 taken from drum T.

Date: June 5, 2014
Time: 13:51
Direction: E
Photo by: S. Townsend
Exposure #: 016
Comments:
IEPA split sample X210 taken from drum V.

R000139

DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg

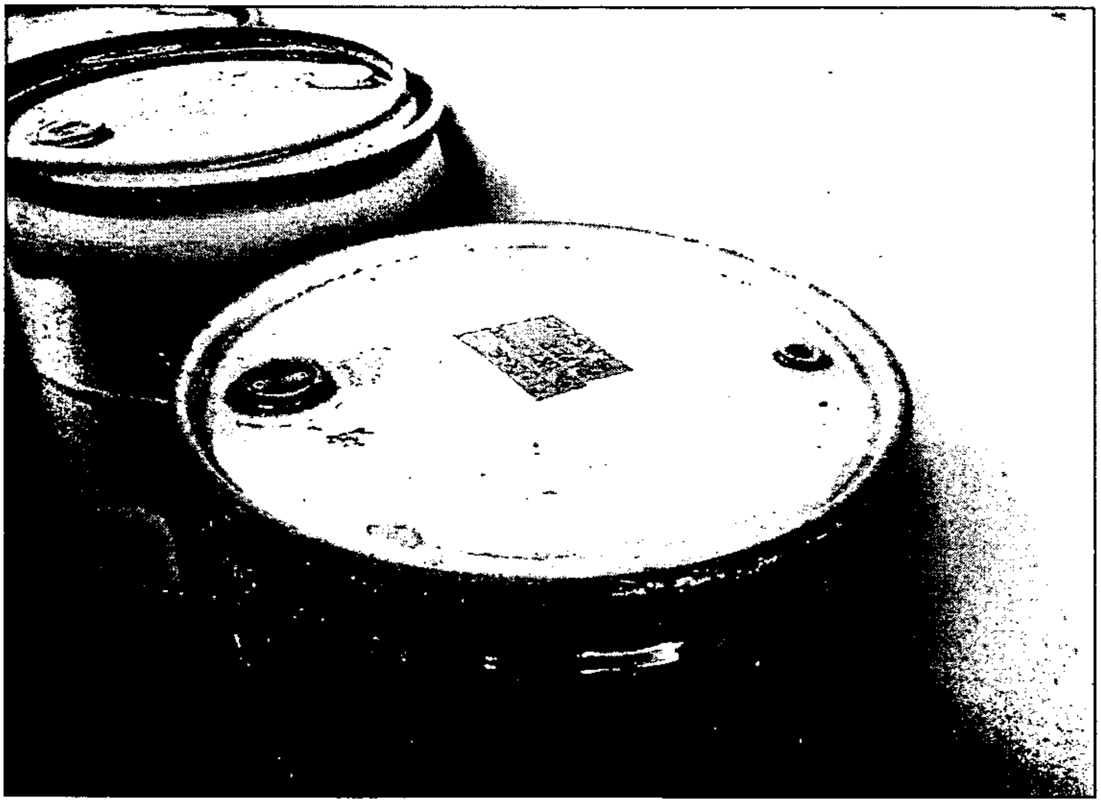
Date: June 5, 2014
Time: 13:54
Direction: NE
Photo by: S. Townsend
Exposure #: 017
Comments:
West floor sump with bailer. Not enough waste water to sample.

Date: June 5, 2014
Time: 13:55
Direction: S-SW
Photo by: S. Townsend
Exposure #: 018
Comments:
Drum F from which sample X201 was collected.

DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg

Date: June 5, 2014
Time: 13:55
Direction: SE
Photo by: S. Townsend
Exposure #: 019
Comments:
Drum G from which sample X202 was collected.



Date: June 5, 2014
Time: 13:55
Direction: SE
Photo by: S. Townsend
Exposure #: 020
Comments:
Drum H from which sample X203 was collected. Drum labeled "sludge paint chips paper plastic."

DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg

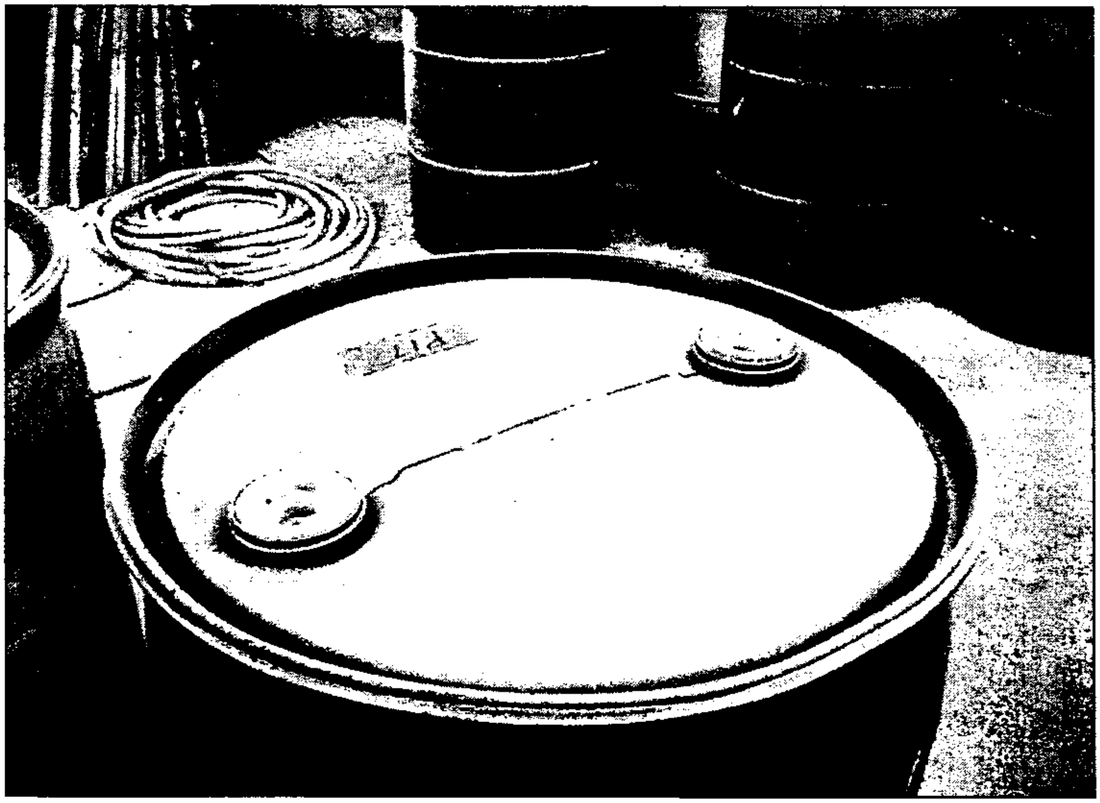
Date: June 5, 2014
Time: 13:55
Direction: SE
Photo by: S. Townsend
Exposure #: 021
Comments:
Drum I from which sample X204 was collected.

Date: June 5, 2014
Time: 13:56
Direction: SW
Photo by: S. Townsend
Exposure #: 022
Comments:
Drum J from which sample X205 was collected.

DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg

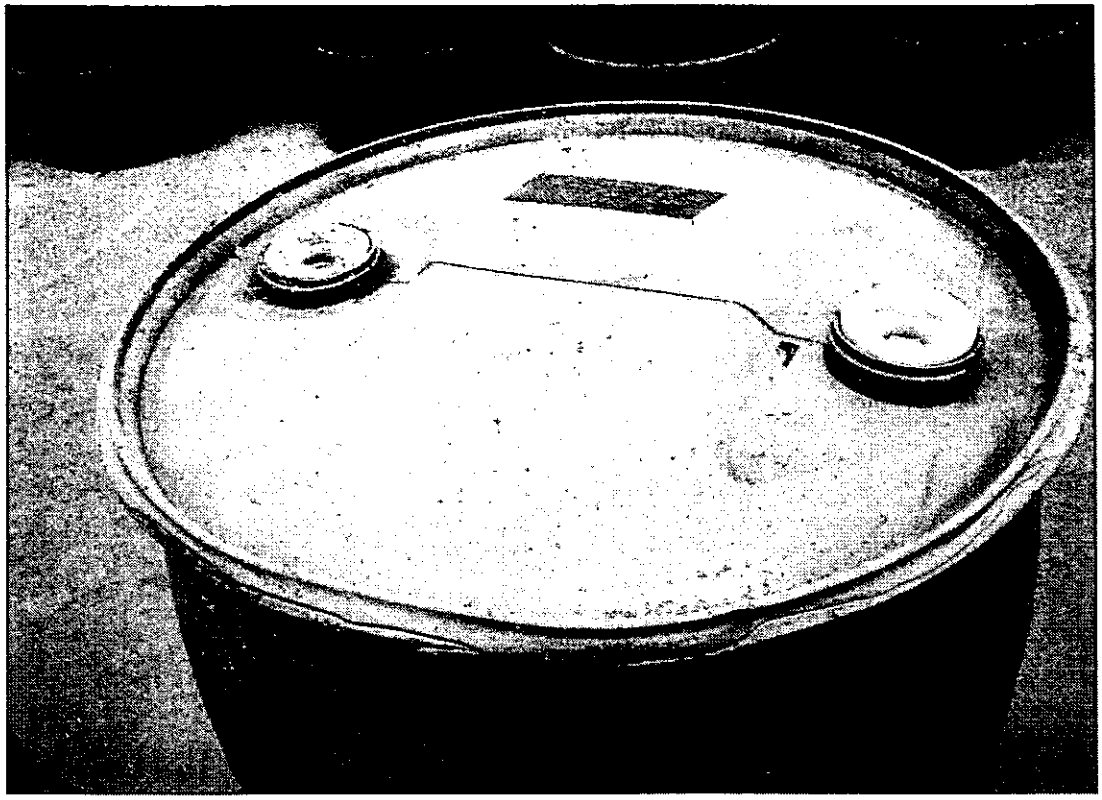
Date: June 5, 2014
Time: 13:57
Direction: SE
Photo by: S. Townsend
Exposure #: 023
Comments:
Drum P from which sample X206 was collected. Drum labeled "Pit sludge."



Date: June 5, 2014
Time: 13:58
Direction: SE
Photo by: S. Townsend
Exposure #: 024
Comments:
Drum R from which sample X207 was collected. Drum labeled "Pit."

DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg

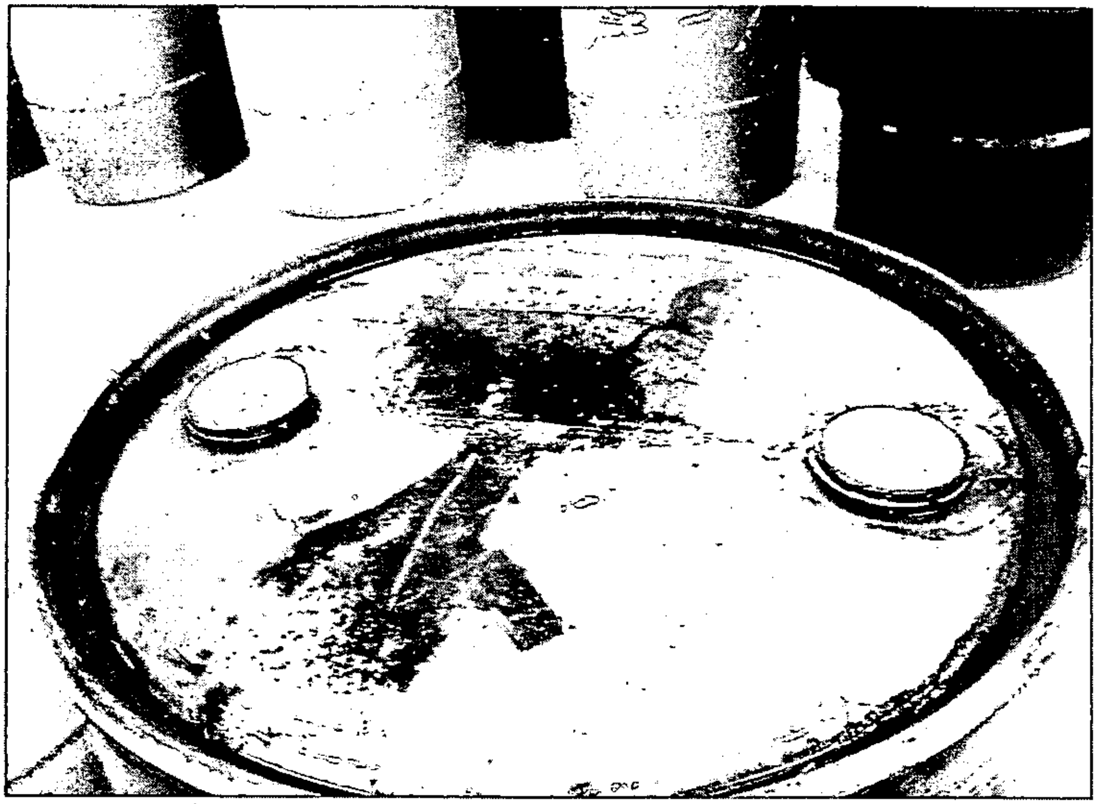


Date: June 5, 2014
Time: 13:59
Direction: S-SE
Photo by: S. Townsend
Exposure #: 025
Comments:
Drum S from which sample X208 was collected. Drum labeled "E &I Rinse."

Date: June 5, 2014
Time: 13:59
Direction: SE
Photo by: S. Townsend
Exposure #: 026
Comments:
Drum T from which sample X209 was collected. Drum labeled "E &I Rinse."

DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg



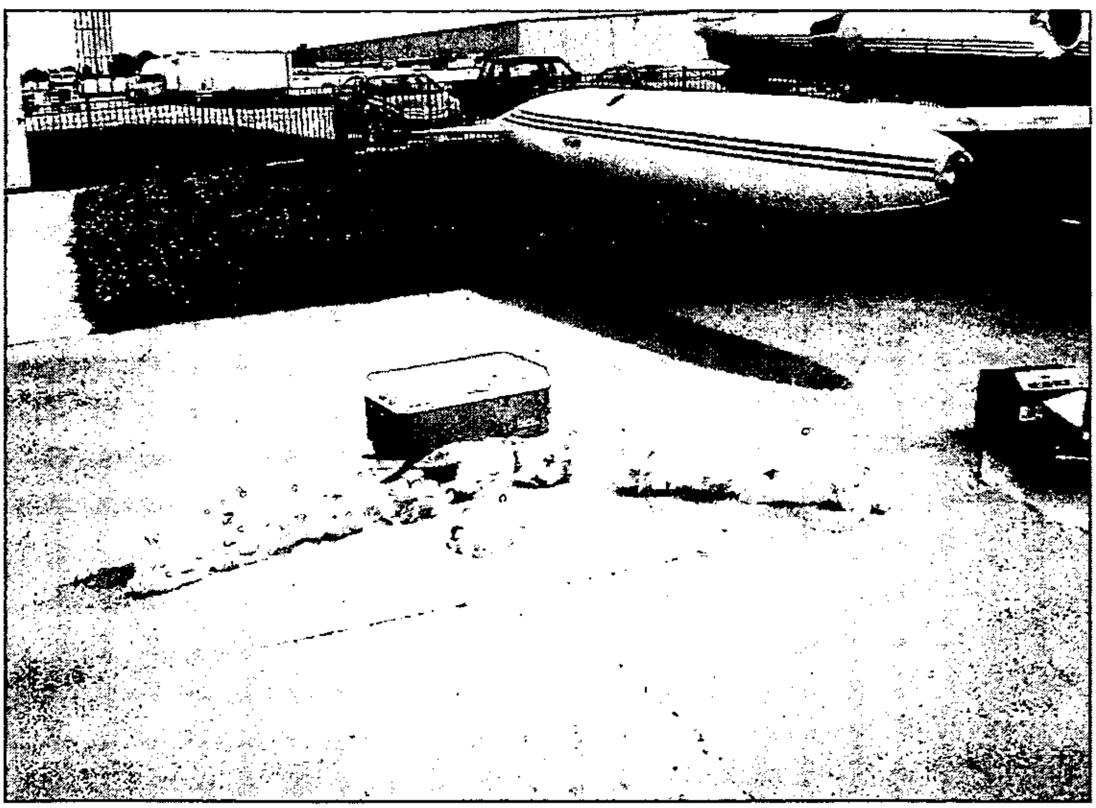
Date: June 5, 2014
Time: 14:00
Direction: SE
Photo by: S. Townsend
Exposure #: 027
Comments:
Drum V from which sample X210 was collected. Drum labeled "Outside drums & pit water."

Date: June 5, 2014
Time: 14:20
Direction: N
Photo by: S. Townsend
Exposure #: 028
Comments:
IEPA Split sample X211 taken from waste in 5-gallon bucket (B1).

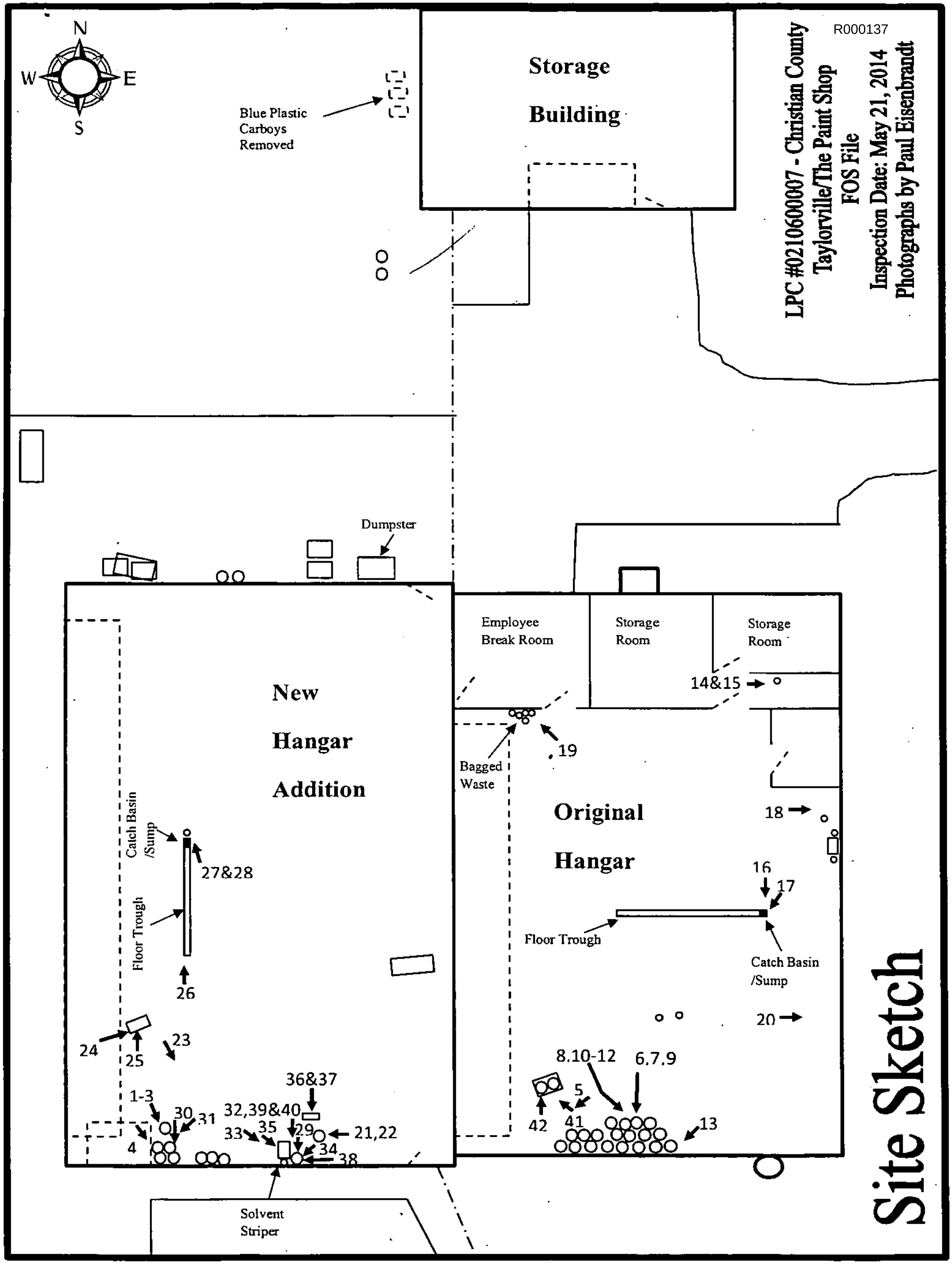
DIGITAL PHOTOGRAPHS

File Names: 0210600007-06052014-[Exp. #].jpg

Date: June 5, 2014
Time: 14:21
Direction: SE
Photo by: S. Townsend
Exposure #: 029
Comments:
5-gallon waste bucket (B1) from which sample X211 was collected.



Date: June 5, 2014
Time: 14:26
Direction: SW
Photo by: S. Townsend
Exposure #: 030
Comments:
Sealed samples temporarily removed from coolers for photograph.



Not to Scale

Direction of Photograph

Measurements Approximate

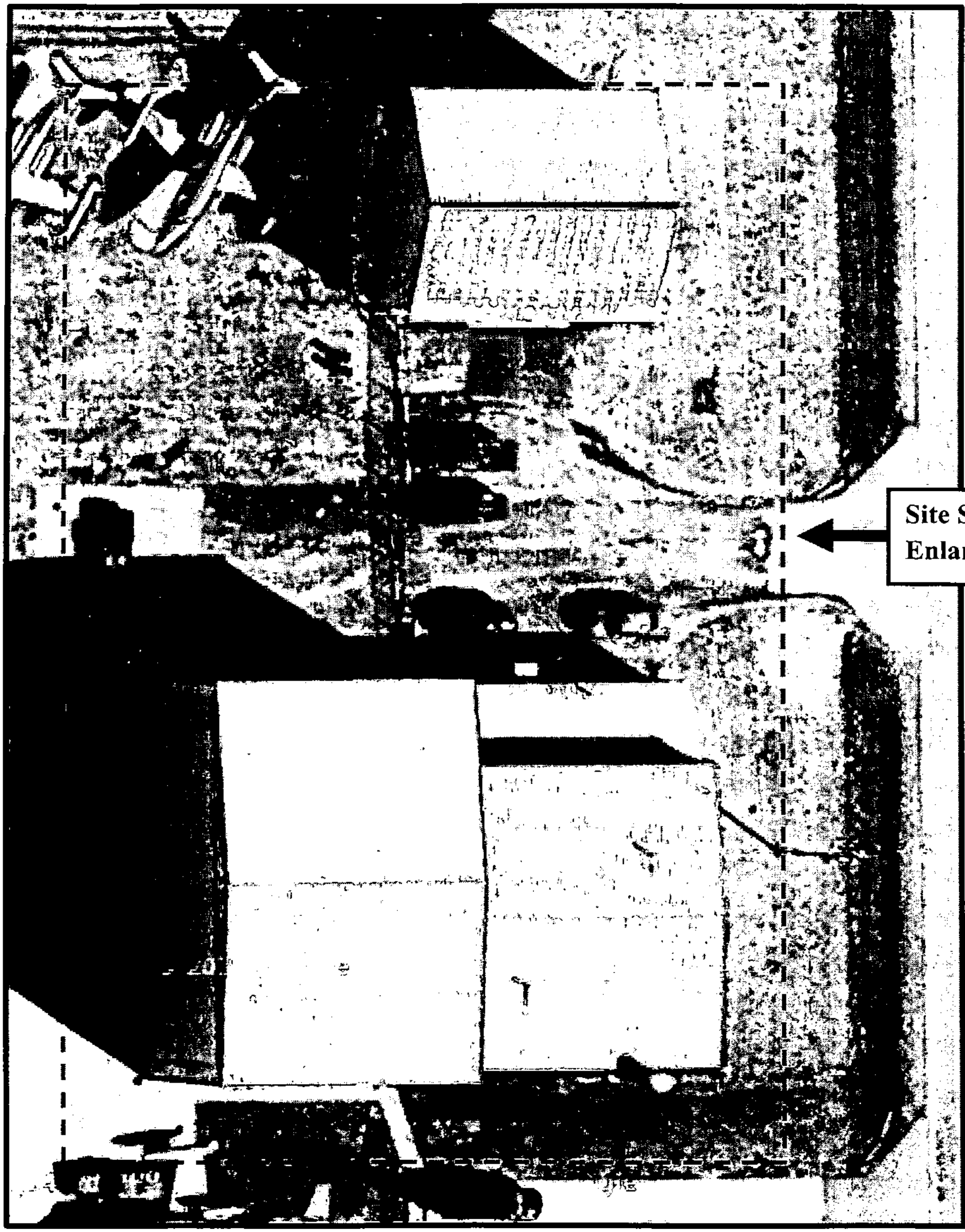
R000138

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

Aerial Image

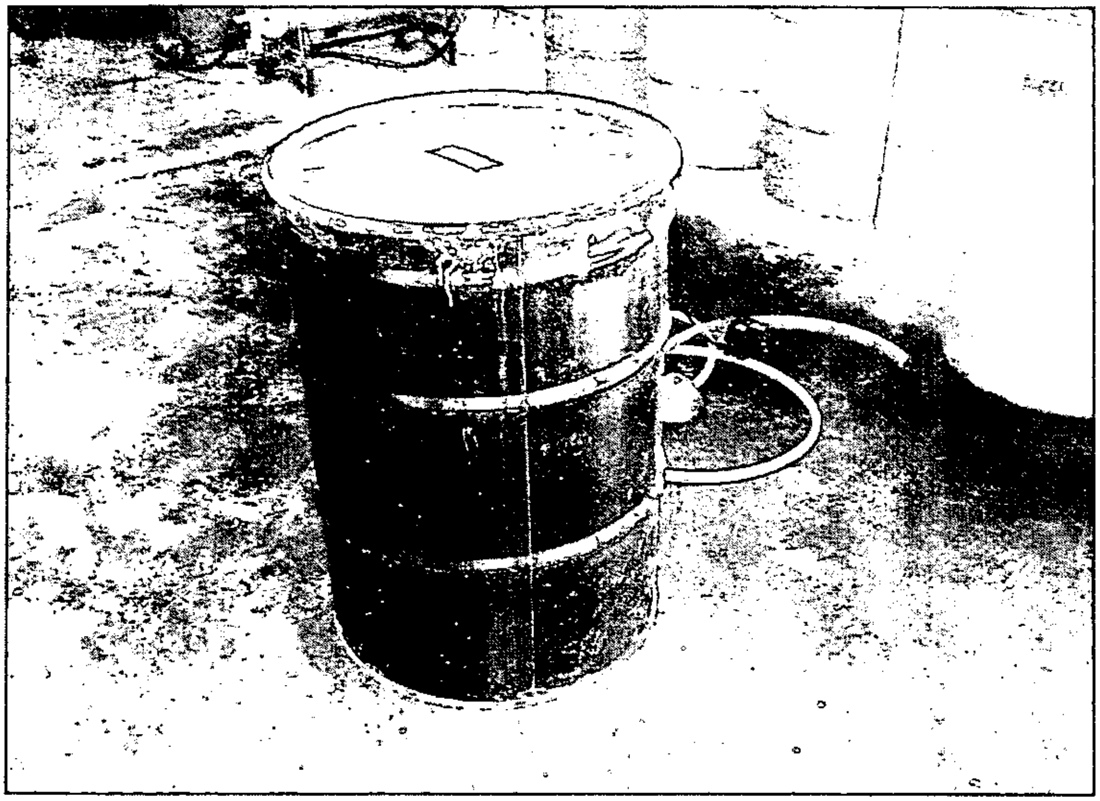
LPC #0210600007 - Christian County
Taylorville/The Paint Shop
FOS File
Inspection Date: May 21, 2014

N W E S



Site Sketch Enlargement

DIGITAL PHOTOGRAPHS



Date: May 21, 2014
Time: 11:13 AM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 001
Comments: According to Mr. Robert Brandis the partially full drum of sludge and paint chips (identified during the May 16, 2014 inspection) was brought into the hangar after the May 16, 2014 inspection.

Date: May 21, 2014
Time: 11:13 AM
Direction: S-SE
Photo by: Eisenbrandt
Exposure #: 002
Comments: The top of the drum (seen in Photograph 001) was labeled "SLUDGE" after the May 16, 2014 inspection.

Photograph File: 0210600007~05212014-[Exp. #].jpg

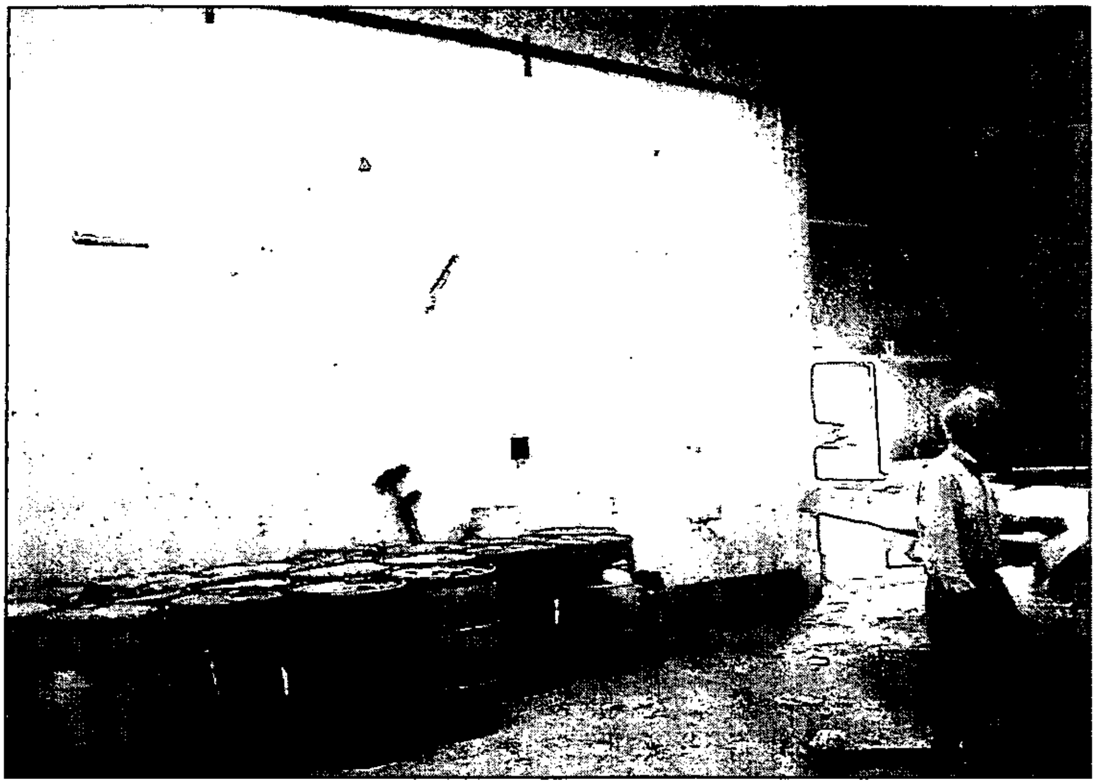
DIGITAL PHOTOGRAPHS

Date: May 21, 2014
Time: 11:14 AM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 003
Comments: View of waste inside the sludge drum (drum seen in Photographs 001 and 002).

Date: May 21, 2014
Time: 11:14 AM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 004
Comments: Drums have been brought into the hangar, cleaned, and labeled "CLEAN", and stacked to the west of the solvent stripper since the May 16, 2014 inspection.

Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS

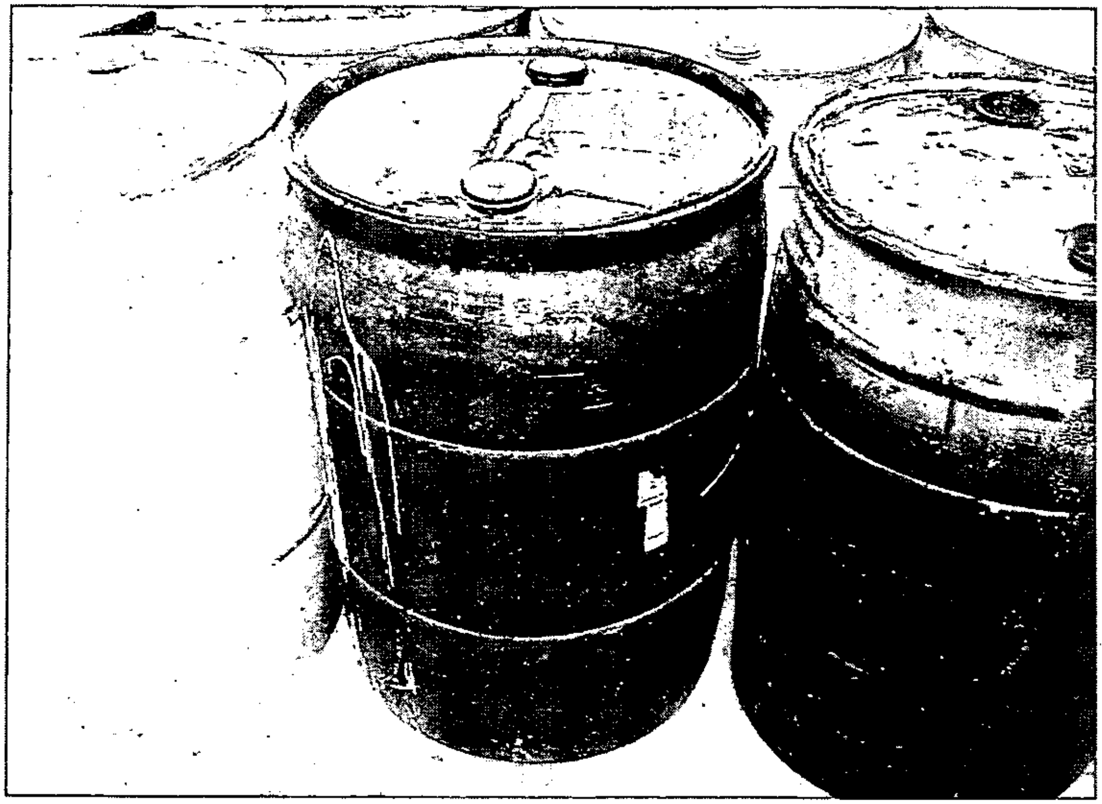


Date: May 21, 2014
Time: 11:17 AM
Direction: SW
Photo by: Eisenbrandt
Exposure #: 005
Comments: Mr. Robert Brandis stated the solvent stripper had previously been located to the right of the drums seen in the photograph.

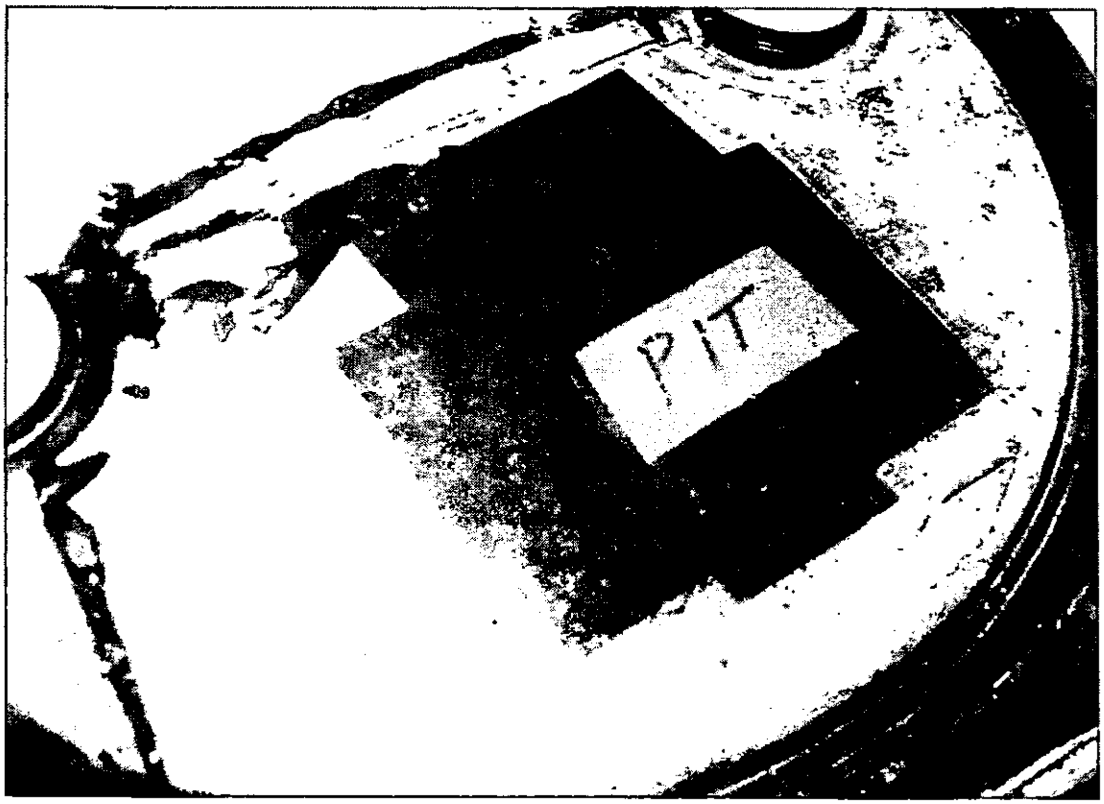
Date: May 21, 2014
Time: 11:17 AM
Direction: S
Photo by: Eisenbrandt
Exposure #: 006
Comments: Nineteen (19) 55-gallon drums stored along the south wall of the hangar. There had been sixteen (16) drums stored at this location during the May 16, 2014 inspection.

Photograph File: 0210600007-05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



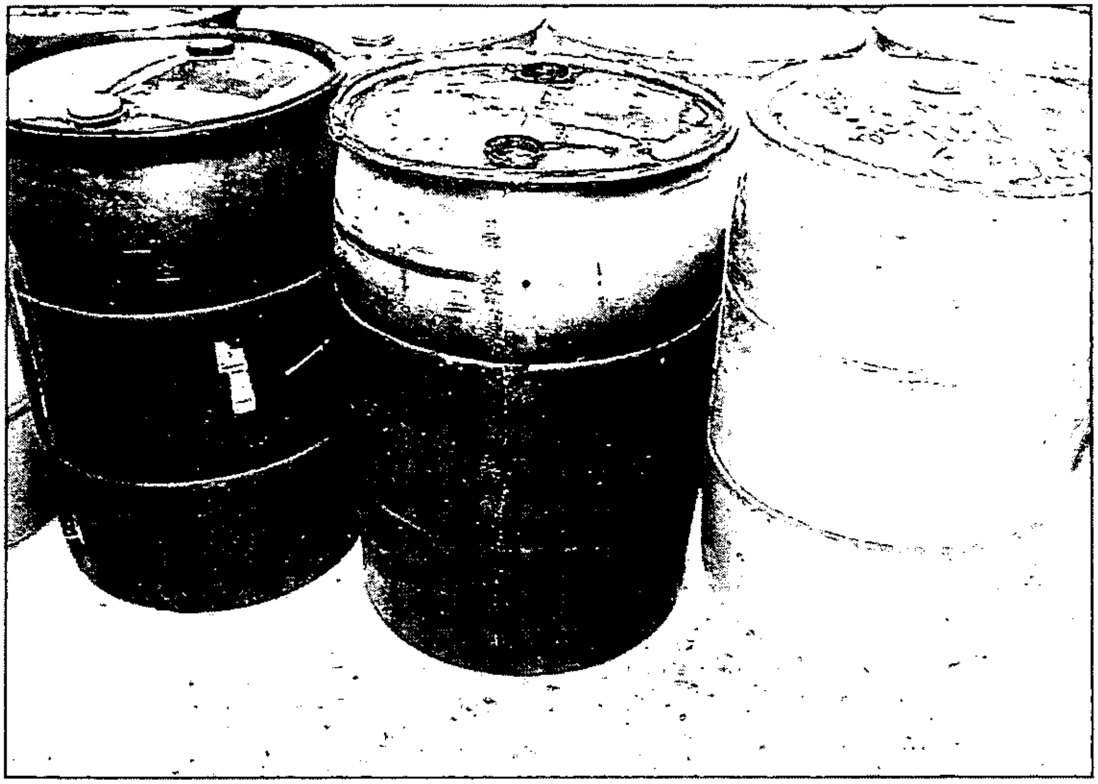
Date: May 21, 2014
Time: 11:17 AM
Direction: S
Photo by: Eisenbrandt
Exposure #: 007
Comments: One of the newly placed drums (on the east end) had a piece of red tape identifying its contents.



Date: May 21, 2014
Time: 11:18 AM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 008
Comments: A close up image shows the east drum (see in Photograph 007) is labeled "PIT".

Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



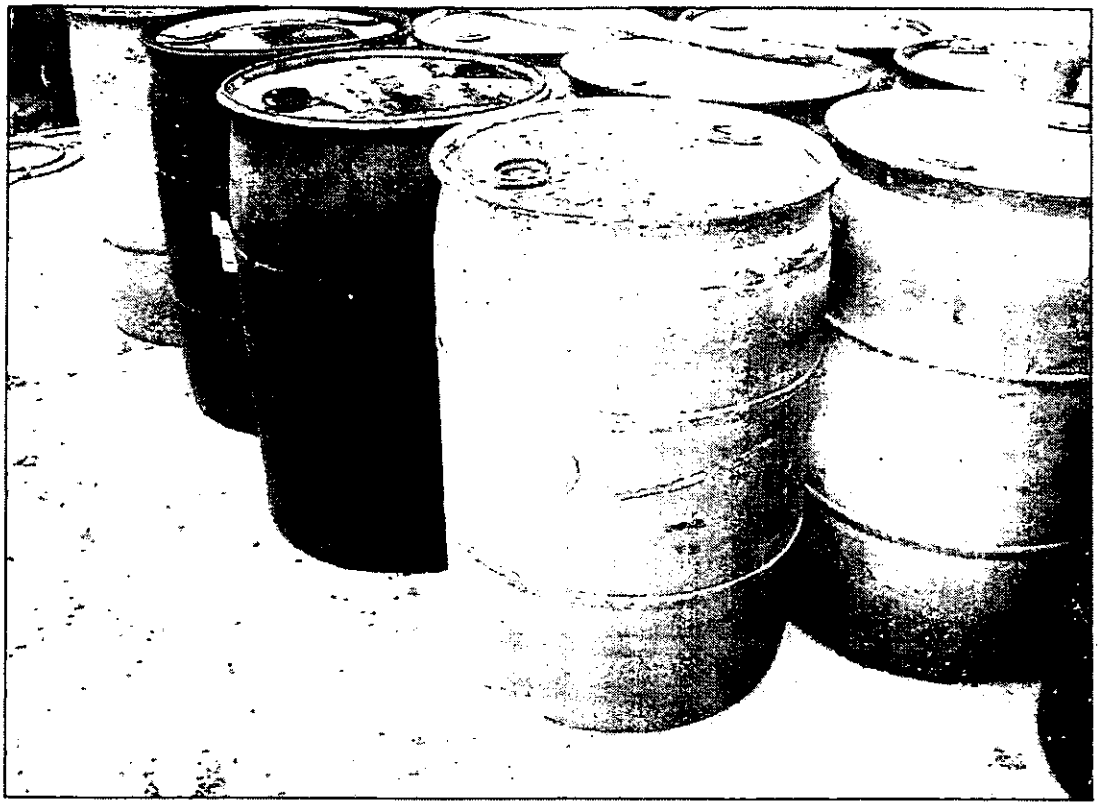
Date: May 21, 2014
Time: 11:18 AM
Direction: S
Photo by: Eisenbrandt
Exposure #: 009
Comments: The newly placed center drum was labeled with a piece of red tape identifying its contents.

Note the missing bung caps.

Date: May 21, 2014
Time: 11:18 AM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 010
Comments: A close up image shows the center drum (see in Photograph 009) is labeled "E & I RINSE".

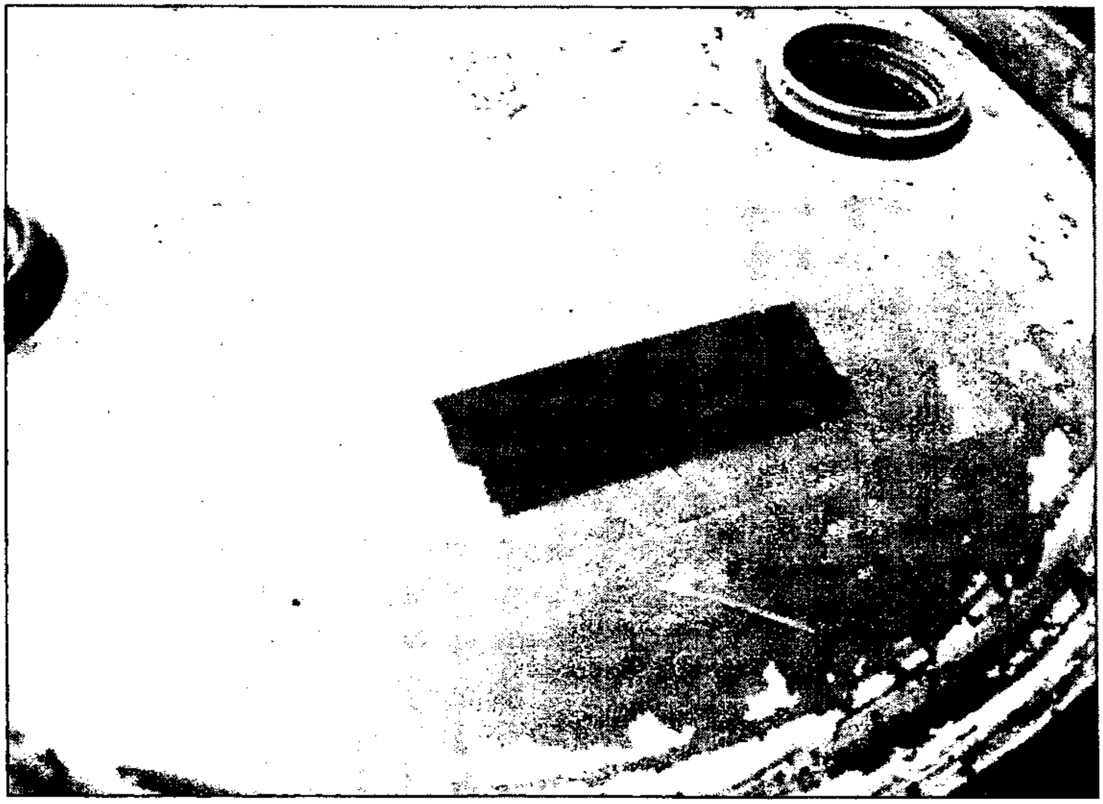
Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



Date: May 21, 2014
Time: 11:19 AM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 011
Comments: The newly placed west drum was labeled with a piece of red tape identifying its contents.

Note the missing bung caps.

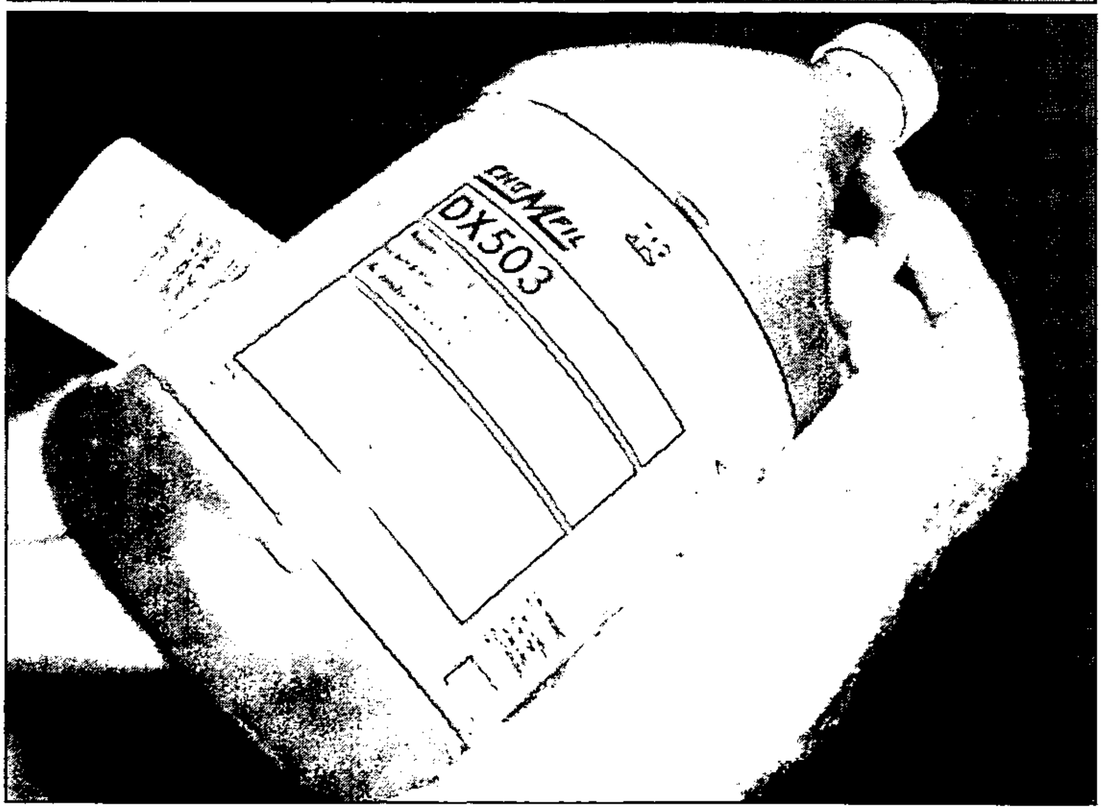


Date: May 21, 2014
Time: 11:19 AM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 012
Comments: A close up image shows the west drum (see in Photograph 011) is labeled "E & I RINSE".

Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS

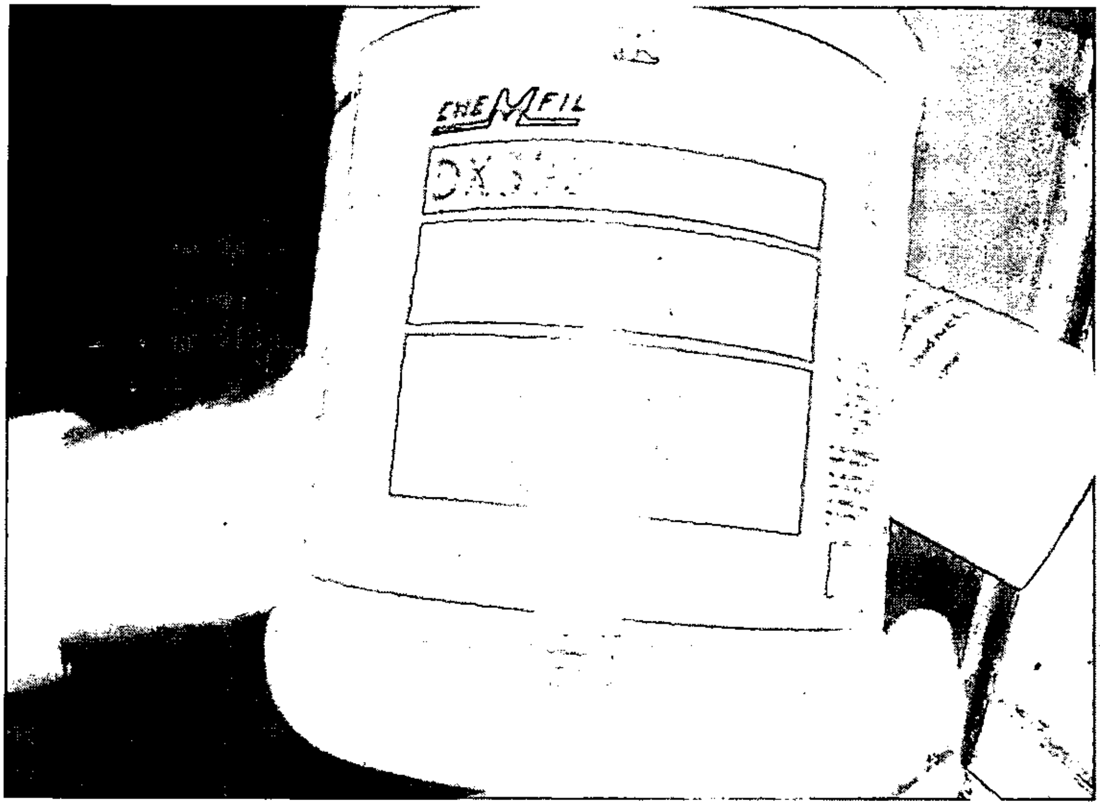
Date: May 21, 2014
Time: 11:19 AM
Direction: S-SW
Photo by: Eisenbrandt
Exposure #: 013
Comments: A piece of red tape placed on the drum in the far left corner (northeast) was not labeled yet.



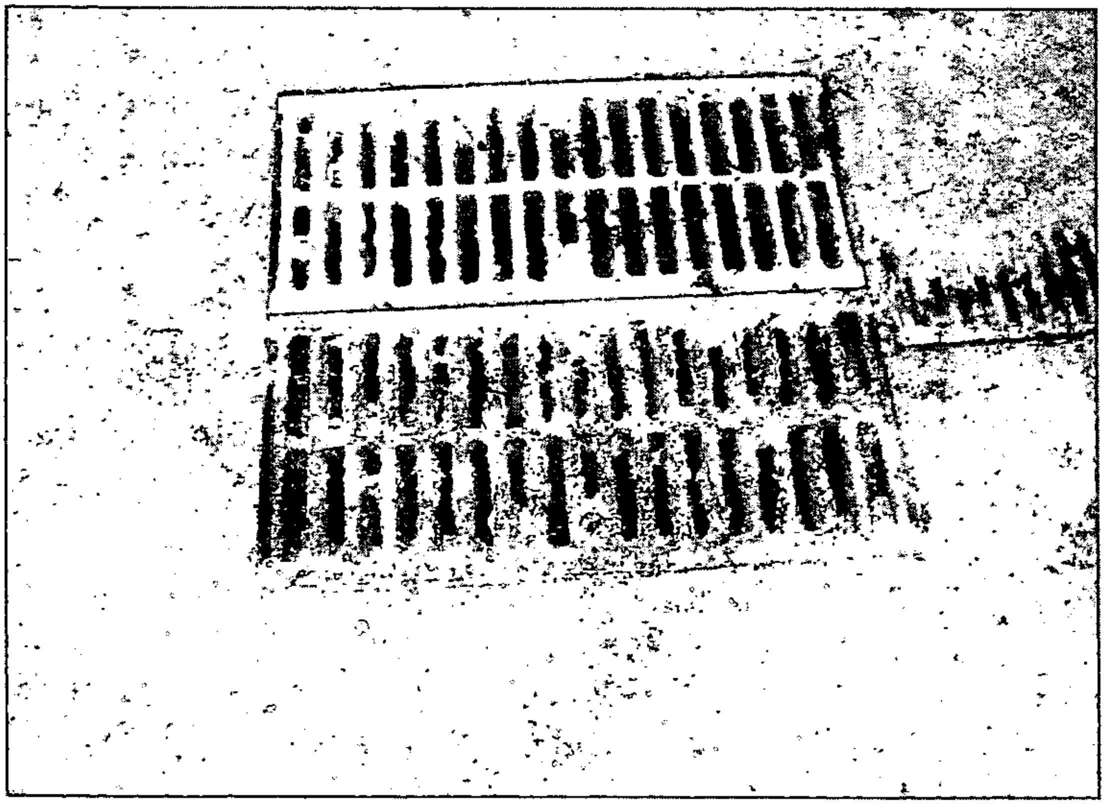
Date: May 21, 2014
Time: 11:21 AM
Direction: E
Photo by: Eisenbrandt
Exposure #: 014
Comments: Label on a one-gallon container of PPG Industries DX503 aluminum conditioner.

Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



Date: May 21, 2014
Time: 11:21 AM
Direction: E
Photo by: Eisenbrandt
Exposure #: 015
Comments: Label on a one-gallon container of PPG Industries DX533 aluminum cleaner.

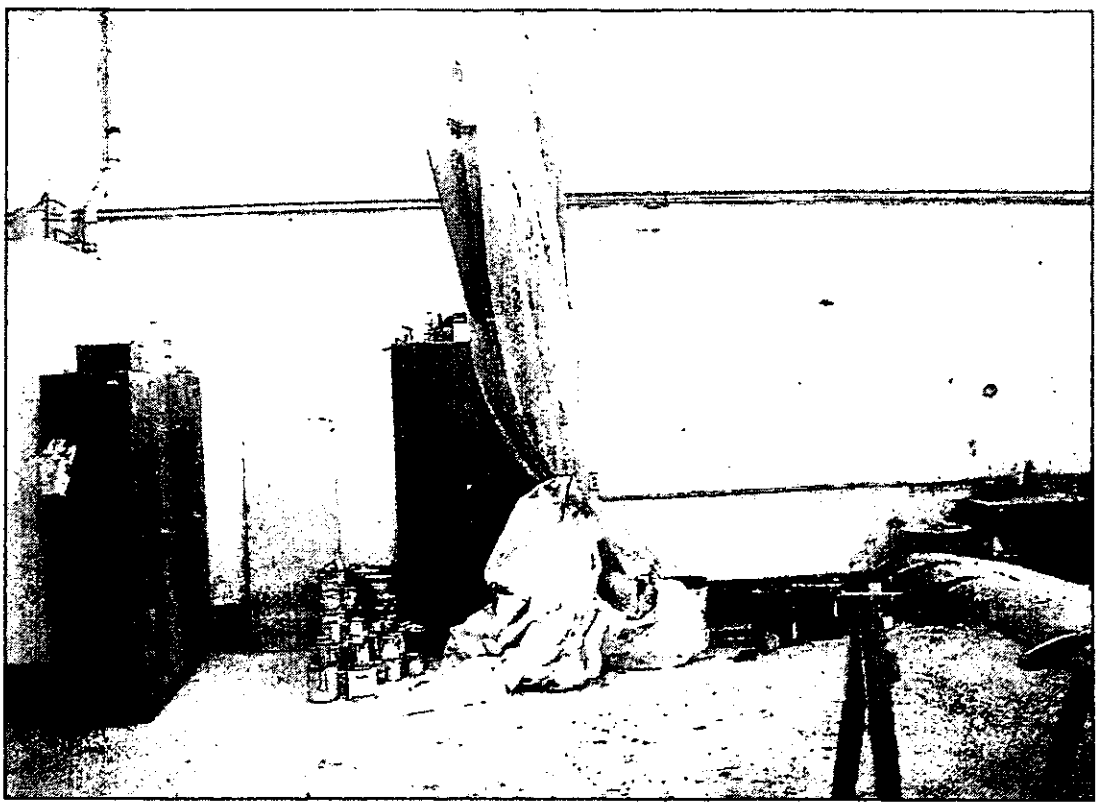


Date: May 21, 2014
Time: 11:22 AM
Direction: S
Photo by: Eisenbrandt
Exposure #: 016
Comments: Catch basin/sump on the east side of the hangar.

Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS

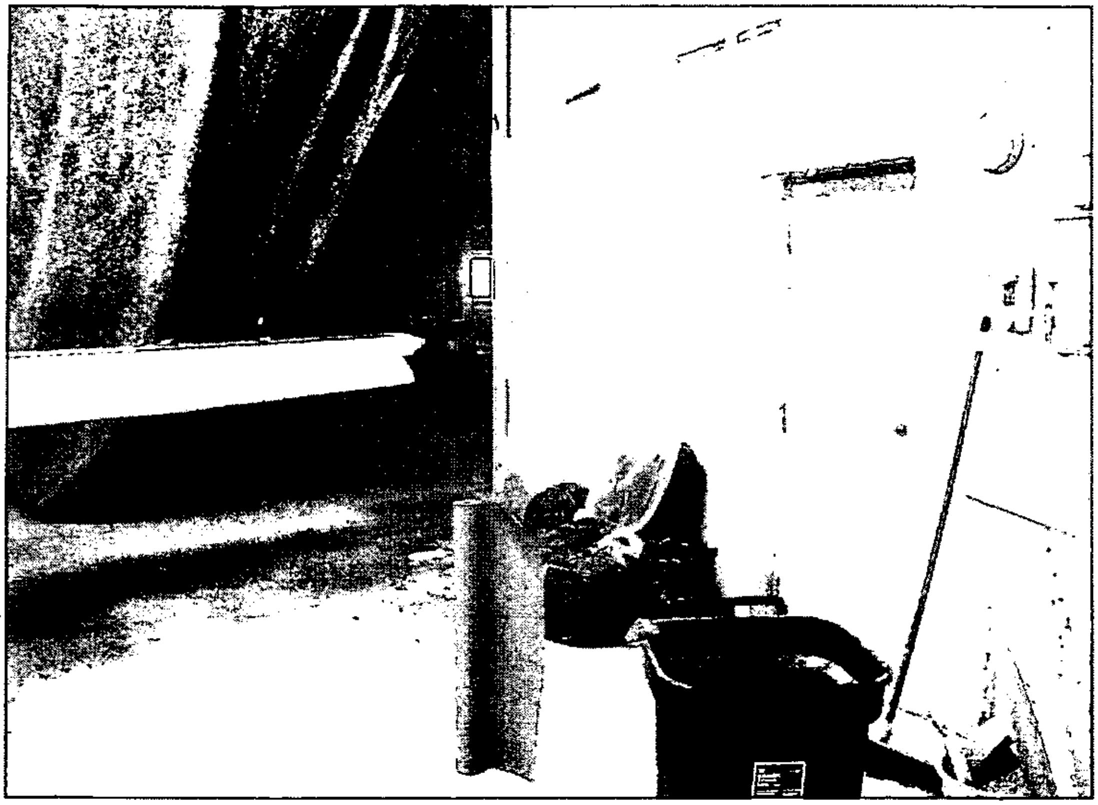
Date: May 21, 2014
Time: 11:23 AM
Direction: SW
Photo by: Eisenbrandt
Exposure #: 017
Comments: View inside the catch basin/sump. Note the blue poly liner.



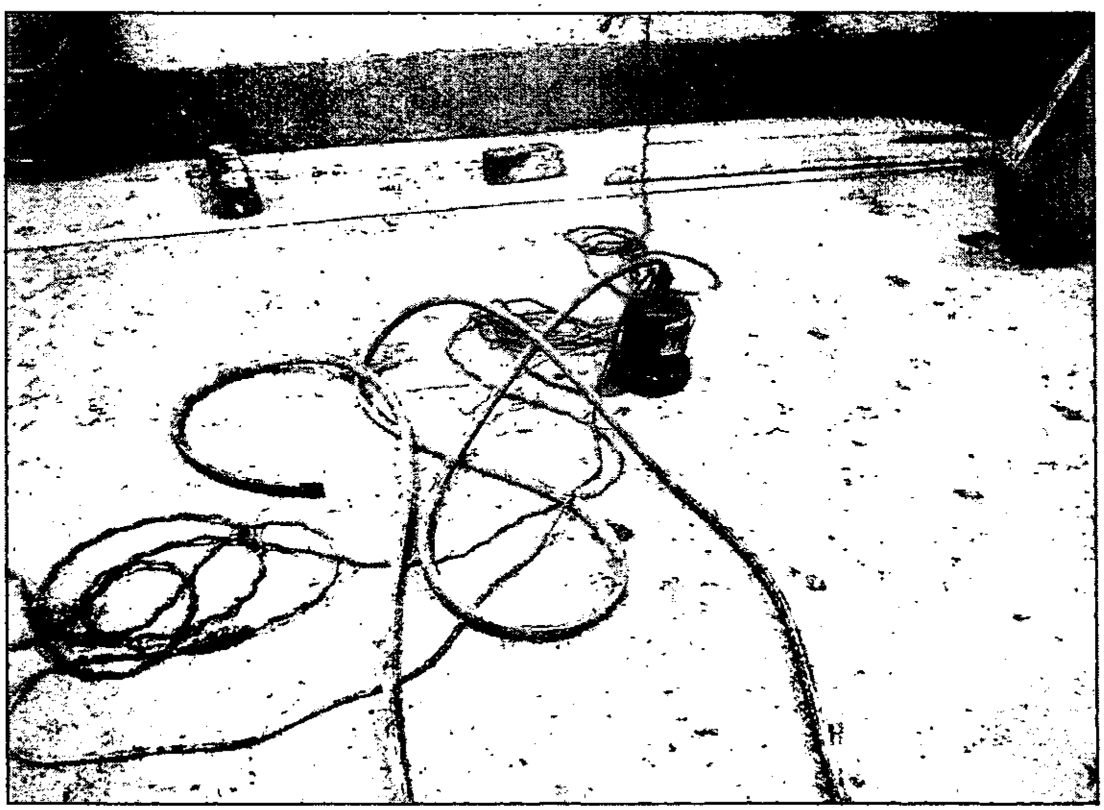
Date: May 21, 2014
Time: 11:23 AM
Direction: E
Photo by: Eisenbrandt
Exposure #: 018
Comments: Plastic curtains used during aircraft painting.

Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



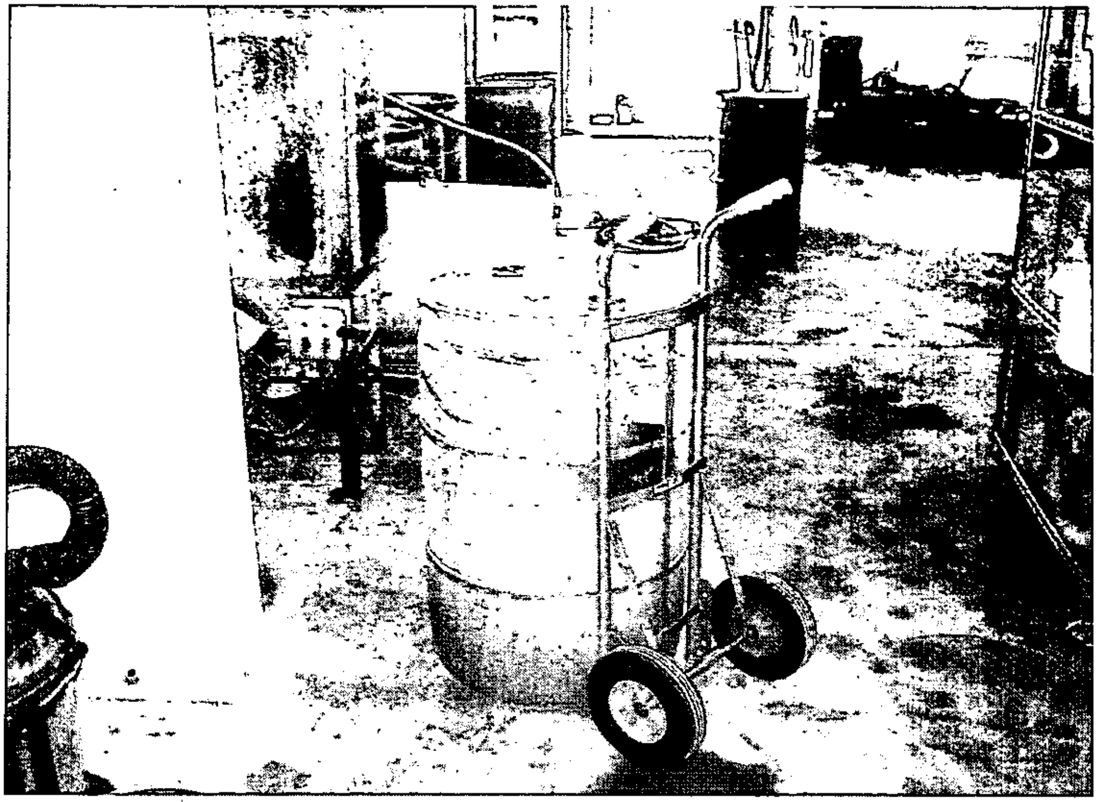
Date: May 21, 2014
Time: 11:23 AM
Direction: NW
Photo by: Eisenbrandt
Exposure #: 019
Comments: At least nine (9) bags of paint stripper waste.



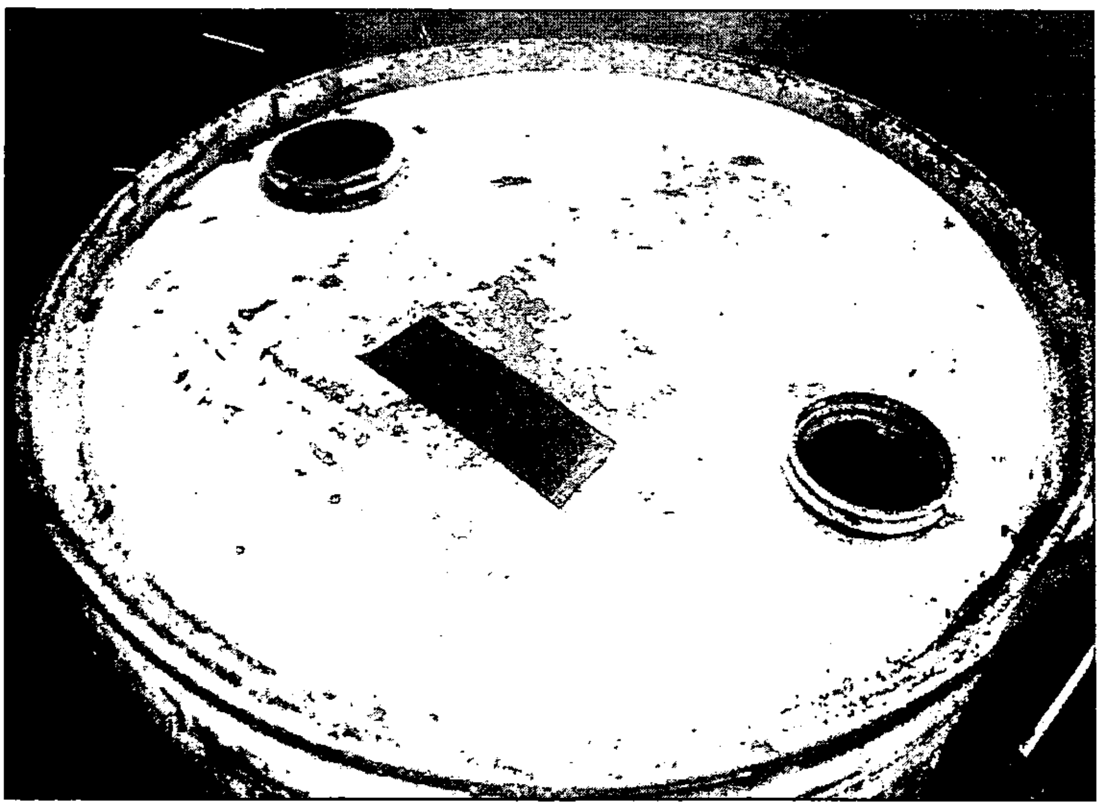
Date: May 21, 2014
Time: 11:23 AM
Direction: E
Photo by: Eisenbrandt
Exposure #: 020
Comments: According to Mr. Robert Brandis, this pump is used to transfer wastewater out of the catch basin/sump into either 55-gallon drums for storage or directly to the solvent stripper for treatment.

Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



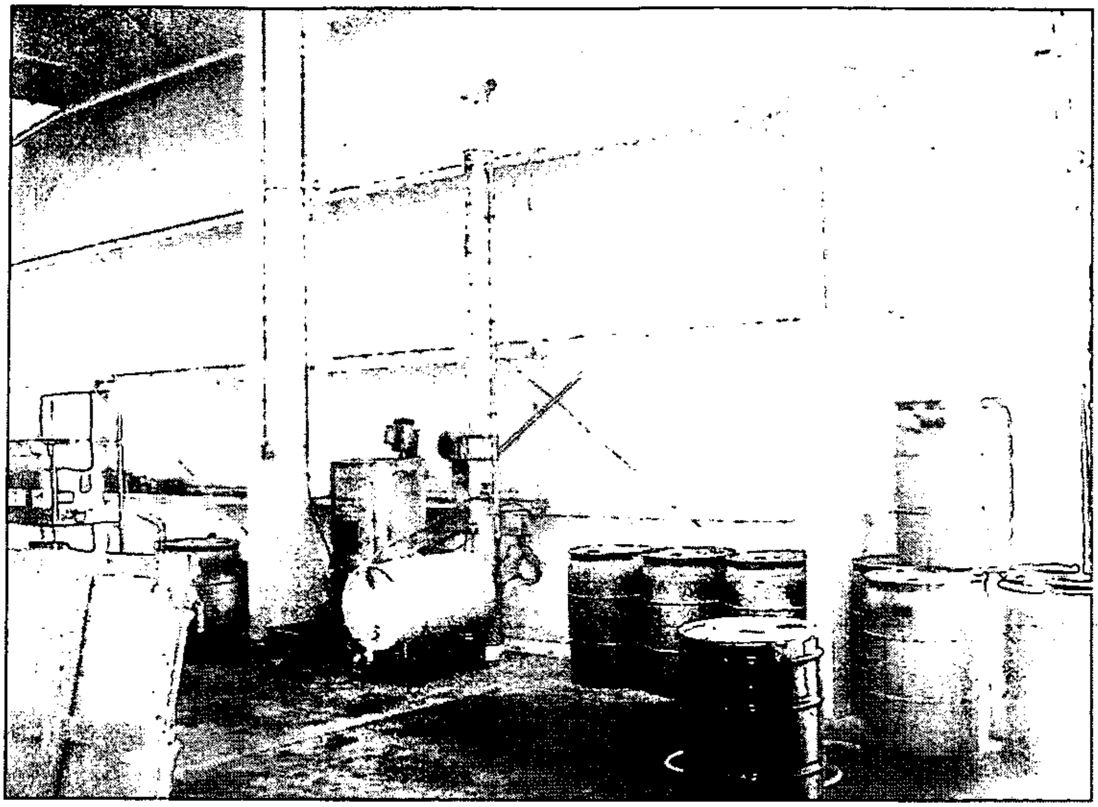
Date: May 21, 2014
Time: 11:25 AM
Direction: W
Photo by: Eisenbrandt
Exposure #: 021
Comments: Blue poly drum and dolly near the solvent stripper.



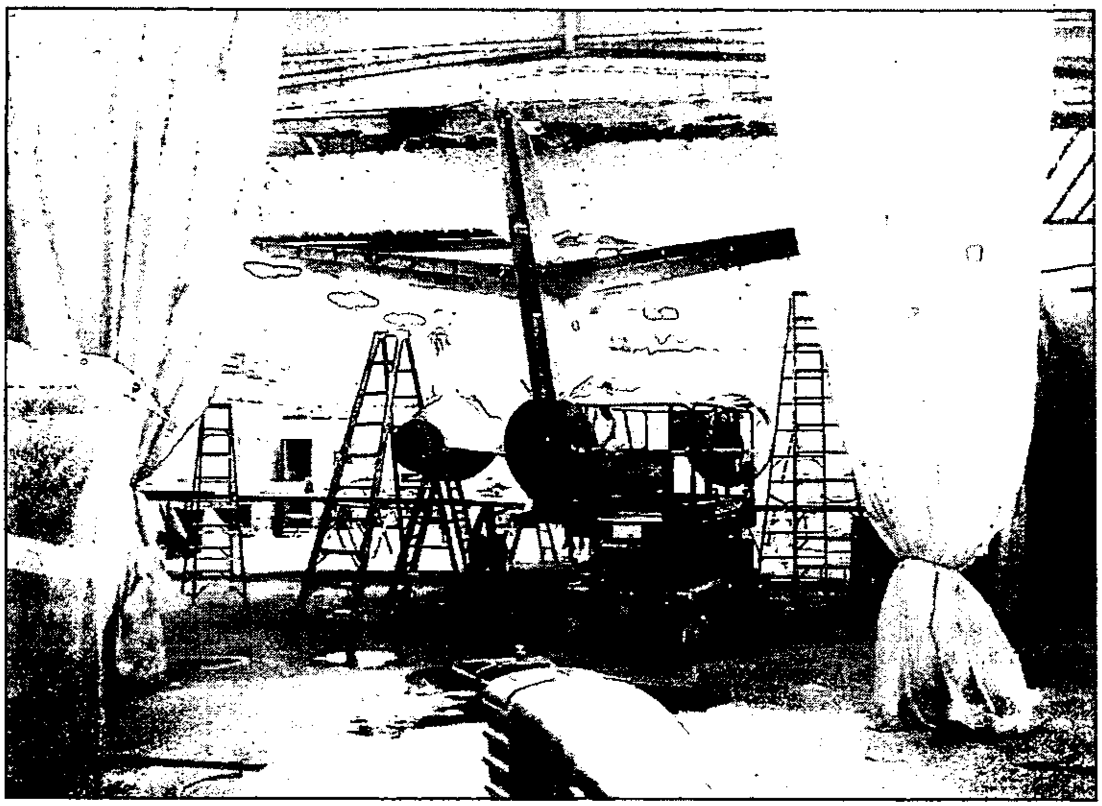
Date: May 21, 2014
Time: 11:25 AM
Direction: W
Photo by: Eisenbrandt
Exposure #: 022
Comments: The drum (also seen in Photograph 021) was full and labeled "E & I Rinse".

Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



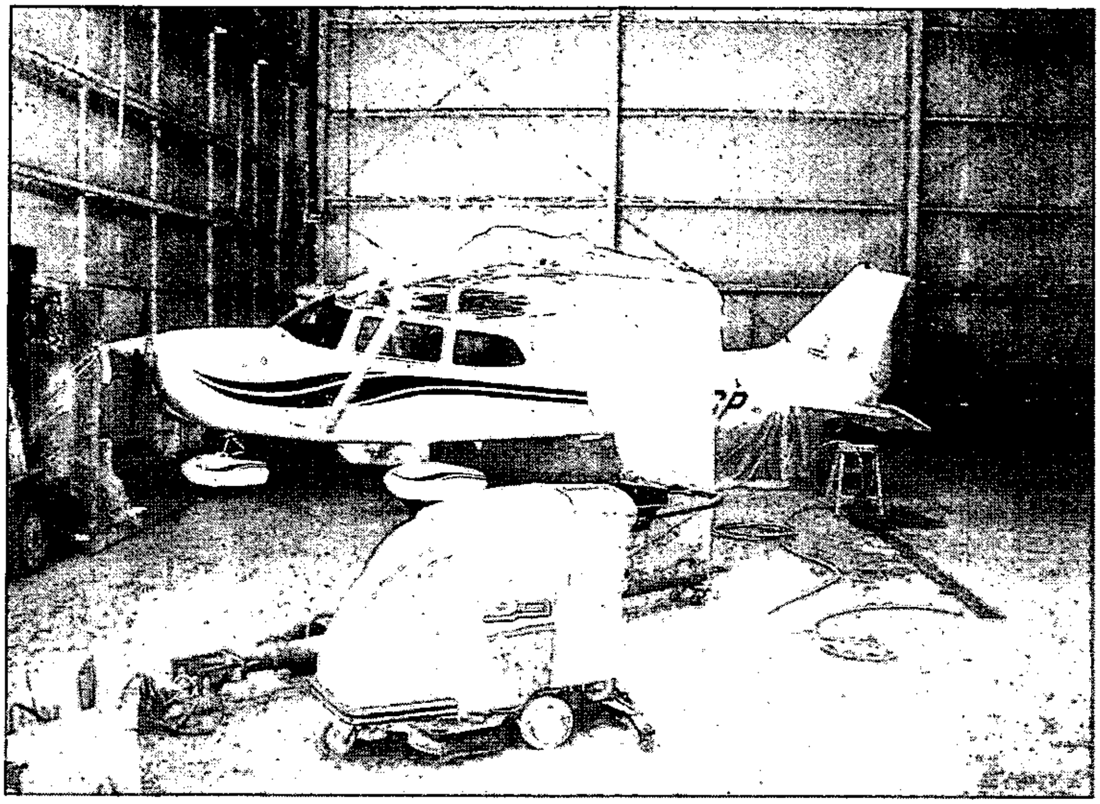
Date: May 21, 2014
Time: 11:27 AM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 023
Comments: The solvent stripper vents directly into the hangar.



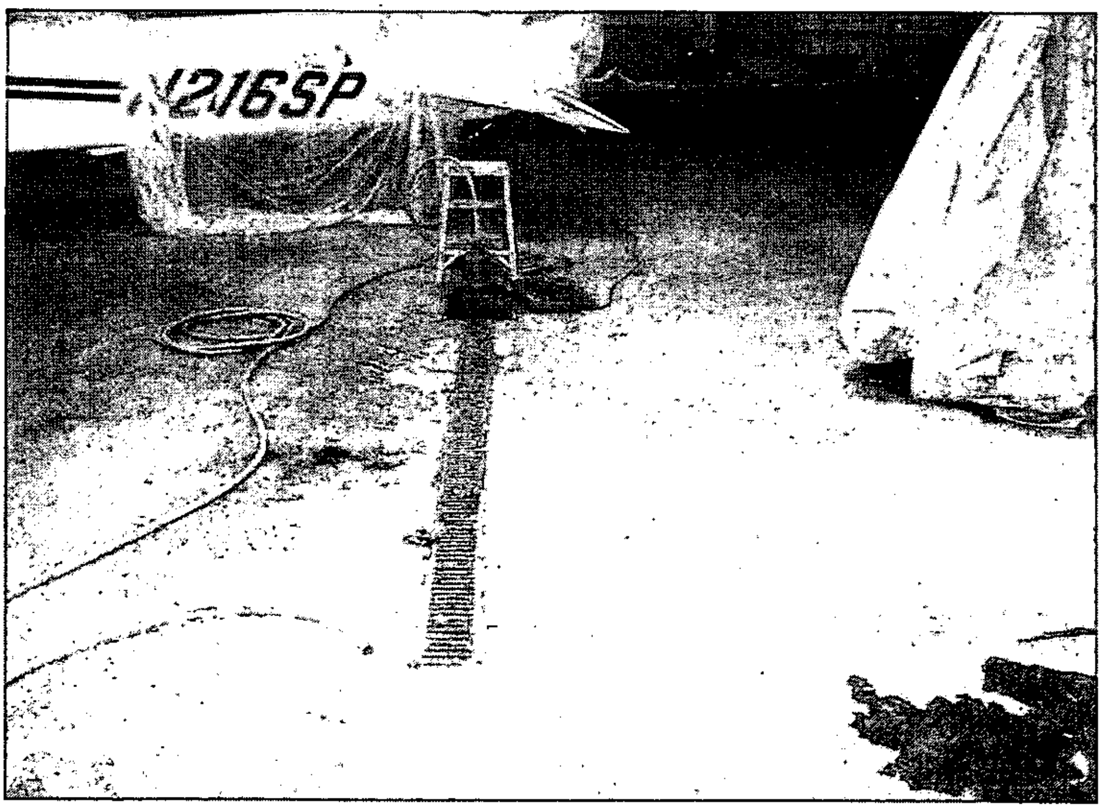
Date: May 21, 2014
Time: 11:28 AM
Direction: E-NE
Photo by: Eisenbrandt
Exposure #: 024
Comments: Aircraft being prepared for painting. The east catch basin/sump is beneath the nose of the airplane. A portion of the west floor trough can be seen in the foreground on the left side of the photograph.

Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



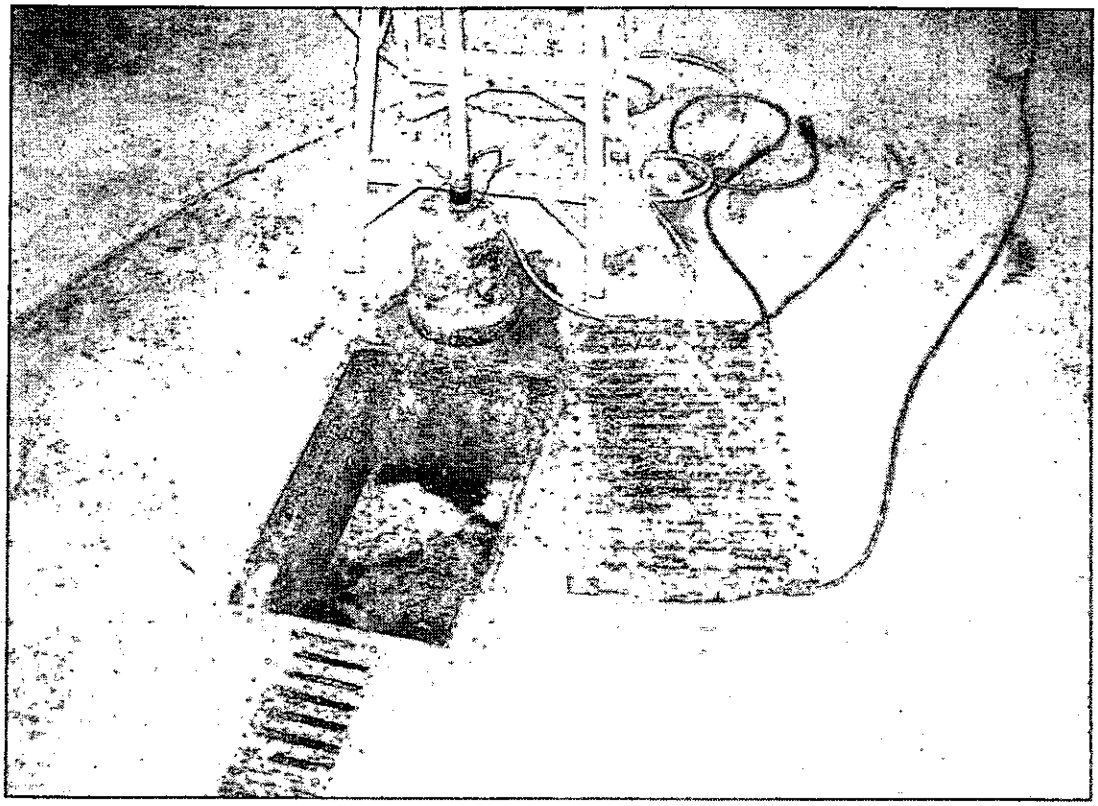
Date: May 21, 2014
Time: 11:28 AM
Direction: N
Photo by: Eisenbrandt
Exposure #: 025
Comments: Aircraft near the west catch basin/sump.



Date: May 21, 2014
Time: 11:28 AM
Direction: N
Photo by: Eisenbrandt
Exposure #: 026
Comments: Western floor trough and catch basin/sump.

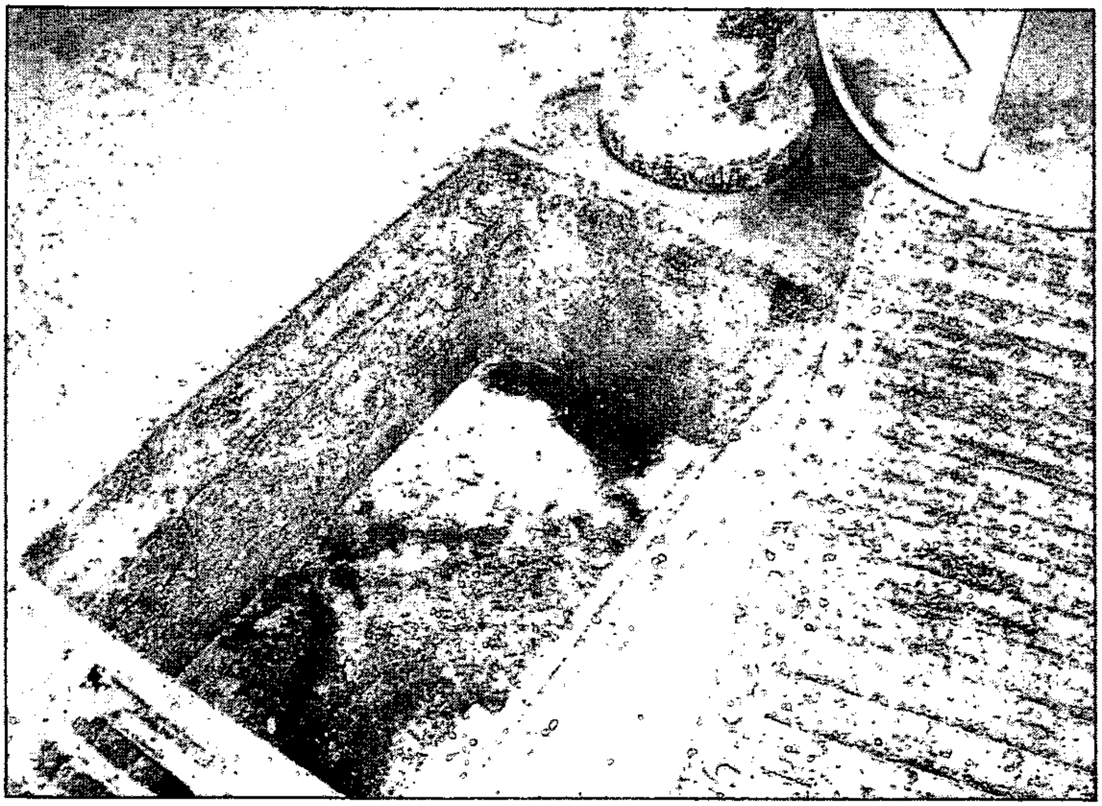
Photograph File: 0210600007-05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



Date: May 21, 2014
Time: 11:28 AM
Direction: N-NW
Photo by: Eisenbrandt
Exposure #: 027
Comments: Another submersible pump recently in use beside the west sump.

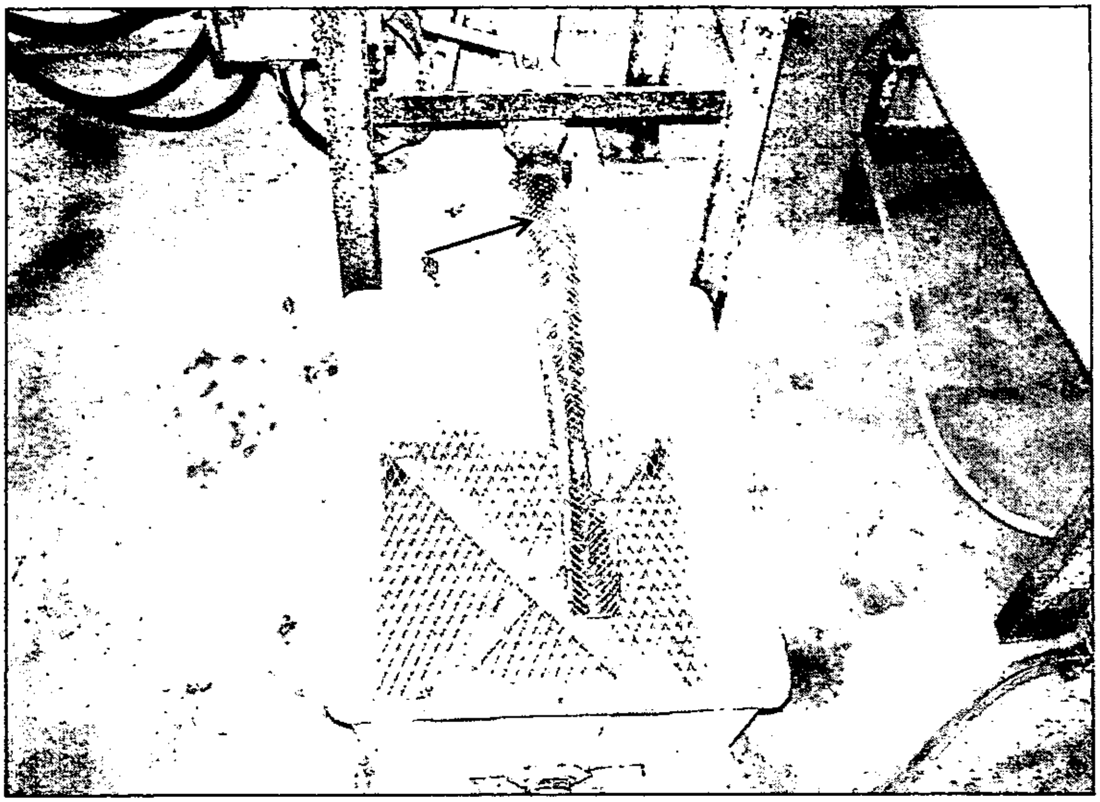
Note the wet concrete around the pump base.



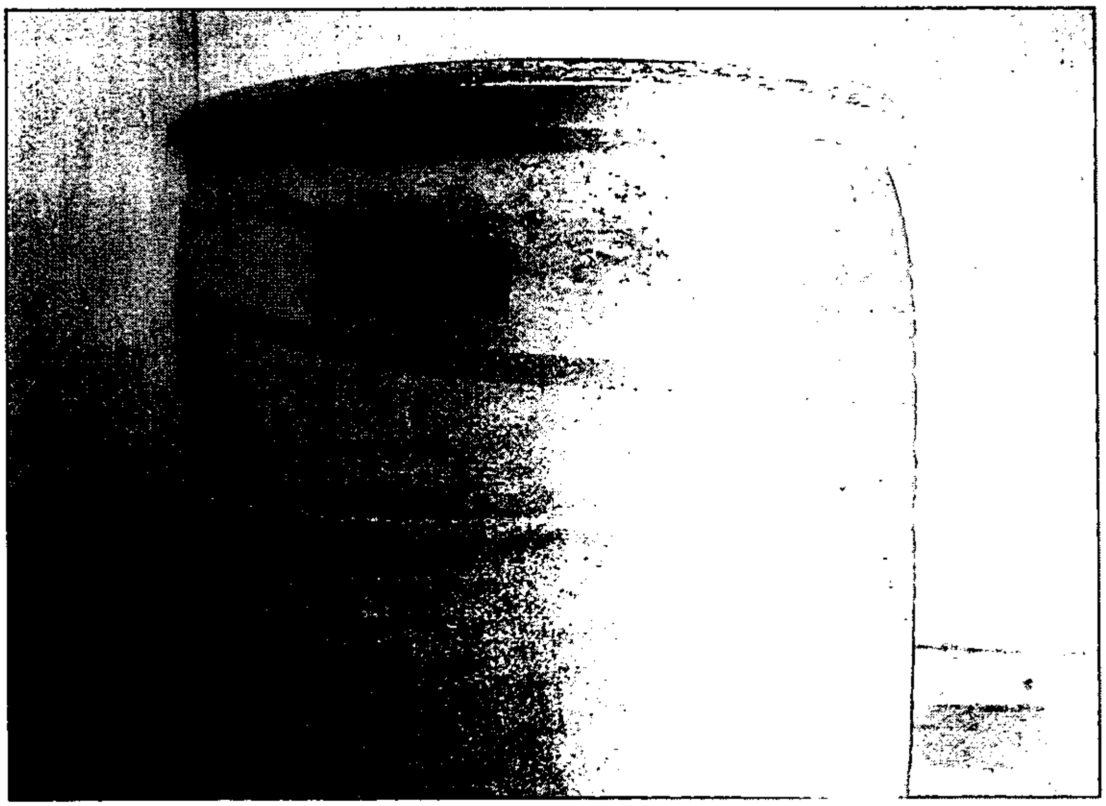
Date: May 21, 2014
Time: 11:28 AM
Direction: NW
Photo by: Eisenbrandt
Exposure #: 028
Comments: Close up image of the waste water in the west catch basin/sump.

Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



Date: May 21, 2014
Time: 11:31 AM
Direction: S
Photo by: Eisenbrandt
Exposure #: 029
Comments: Newly fitted hose on the solvent striper hopper discharge valve.

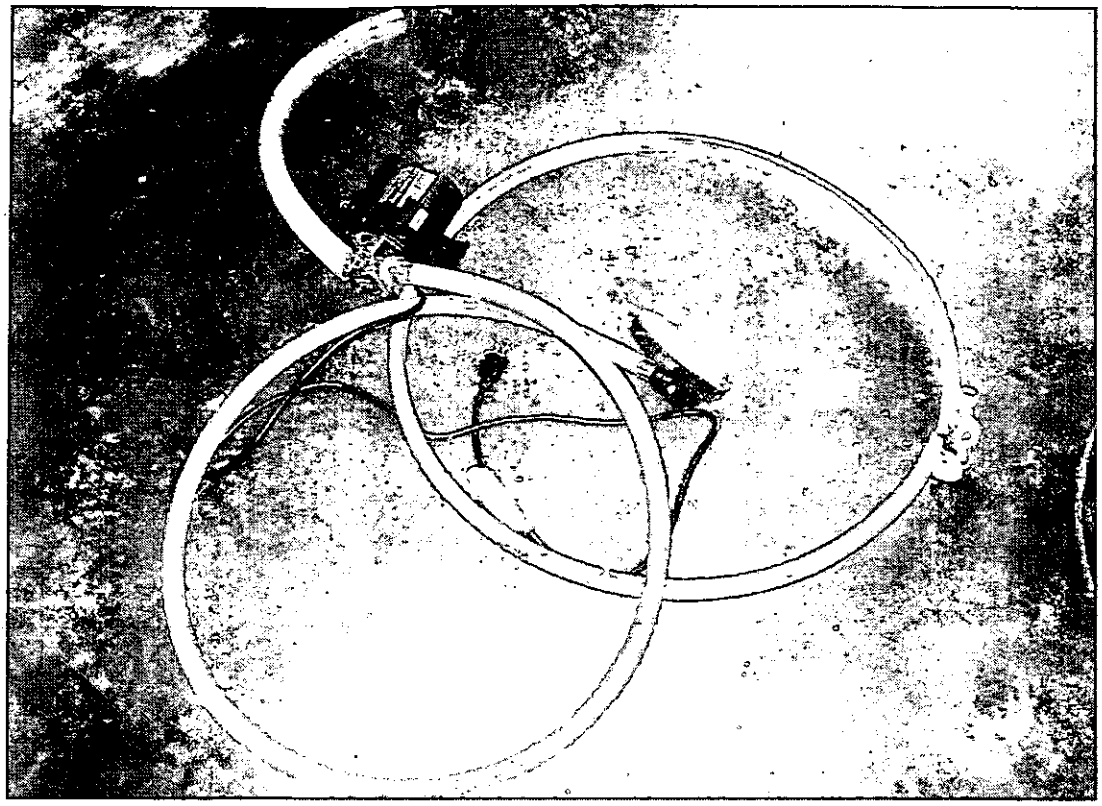


Date: May 21, 2014
Time: 11:32 AM
Direction: S
Photo by: Eisenbrandt
Exposure #: 030
Comments: There were five (5) drums labeled "CLEAN" to the west of the solvent striper. See drum stack on the right side of Photograph 023.

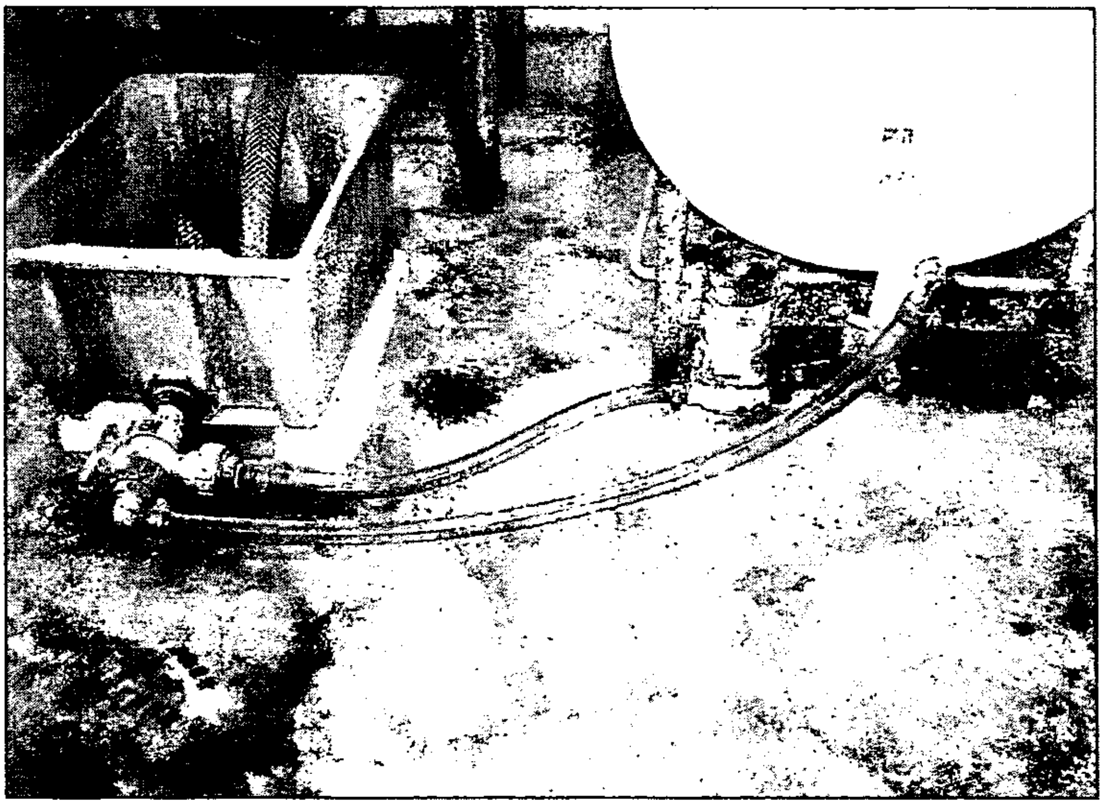
Photograph File: 0210600007~05212014-[Exp. #].jpg

R000154

DIGITAL PHOTOGRAPHS



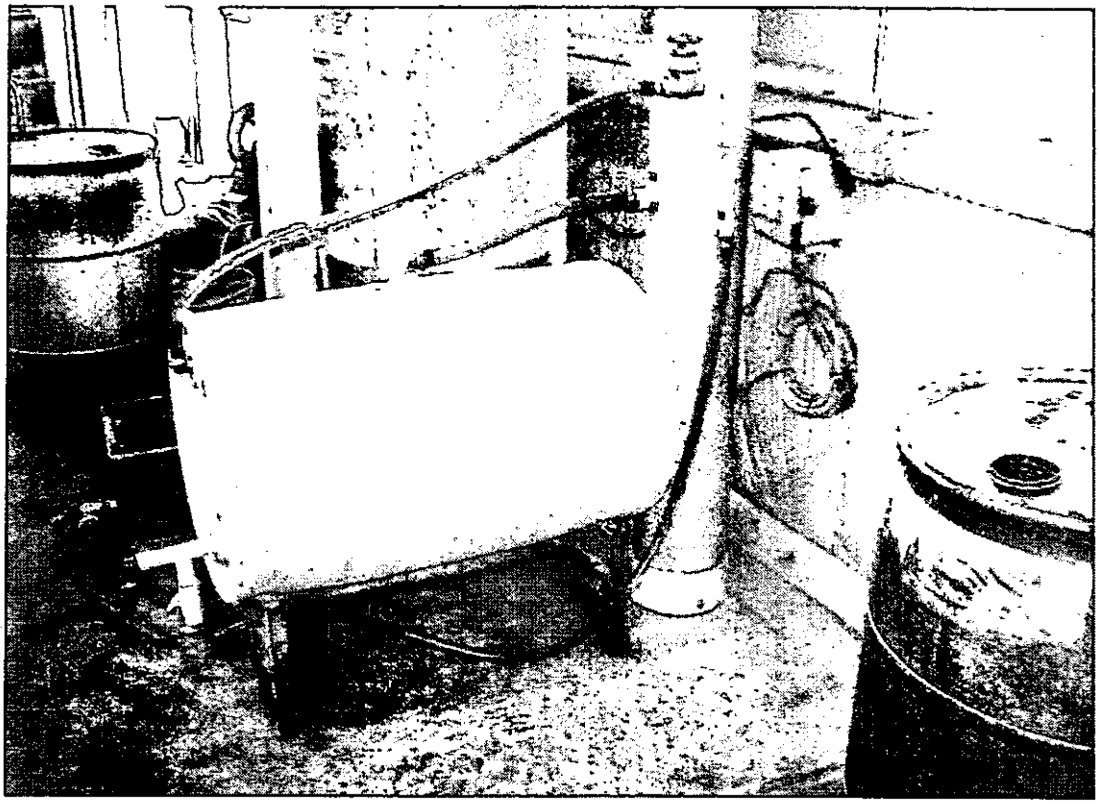
Date: May 21, 2014
Time: 11:32 AM
Direction: SW
Photo by: Eisenbrandt
Exposure #: 031
Comments: A new drum pump.



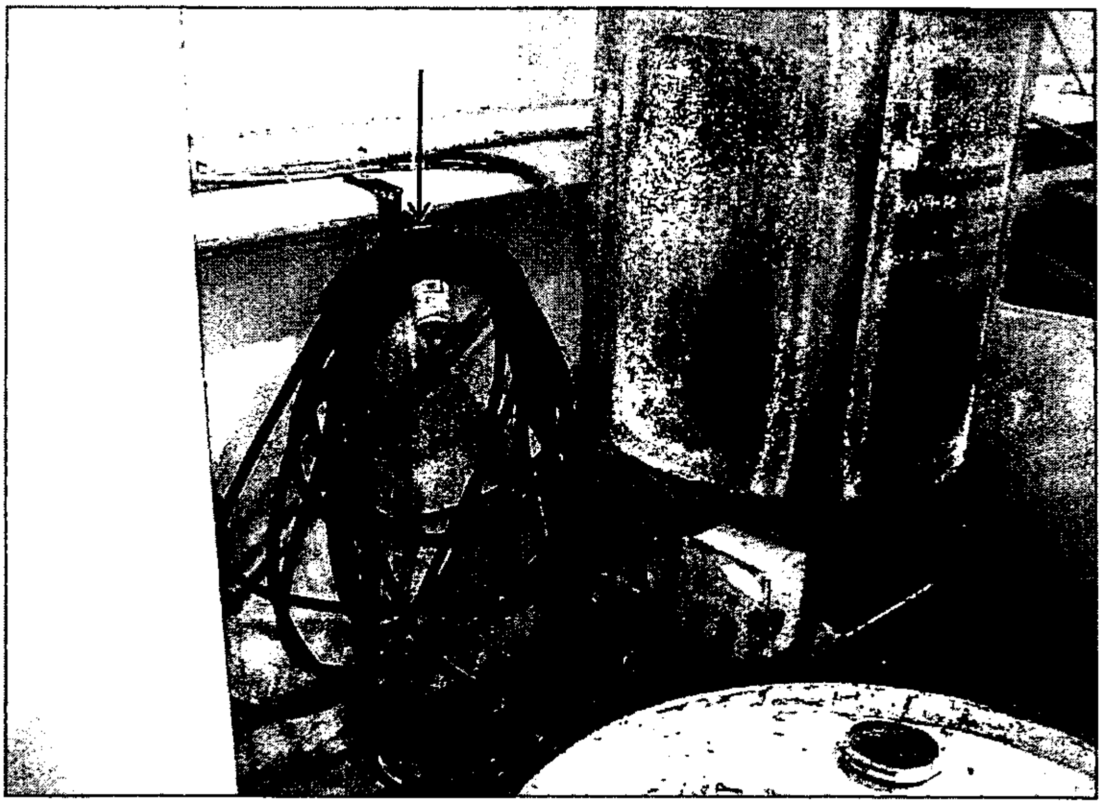
Date: May 21, 2014
Time: 11:33 AM
Direction: S
Photo by: Eisenbrandt
Exposure #: 032
Comments: Recently installed new tubing on the solvent striper.

Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



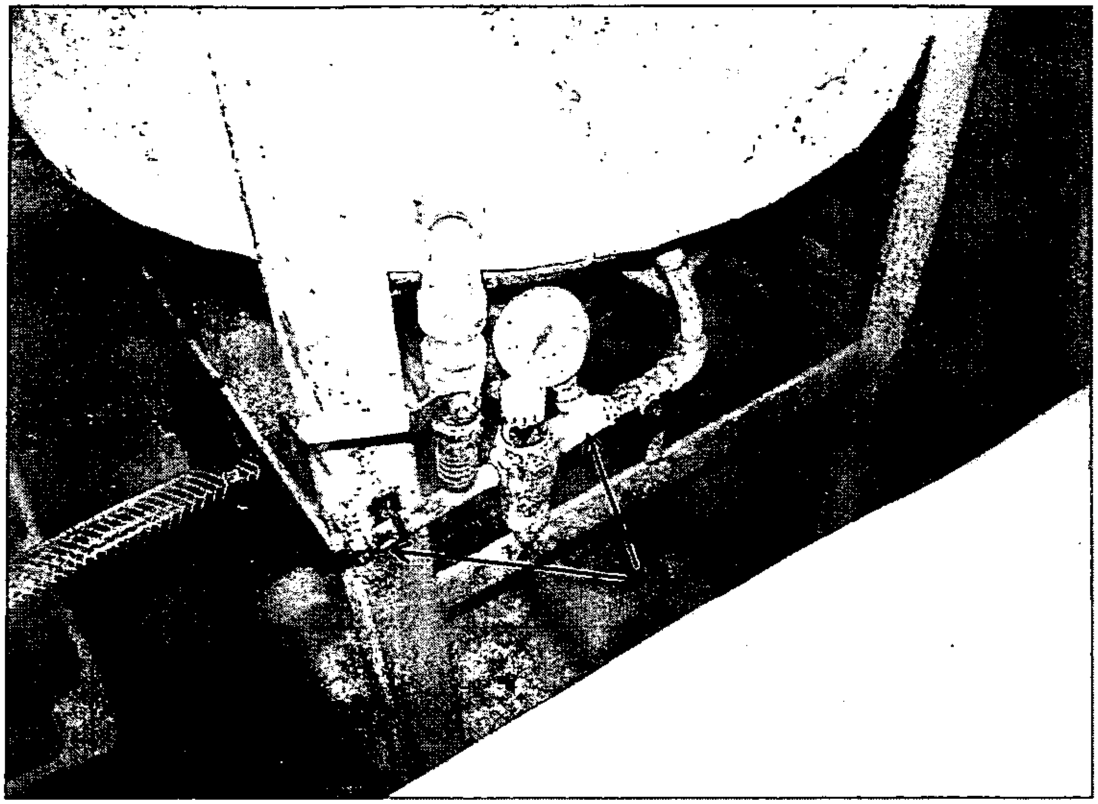
Date: May 21, 2014
Time: 11:33 AM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 033
Comments: Side view of the solvent stripper showing some of the new tubing and the piping configuration.



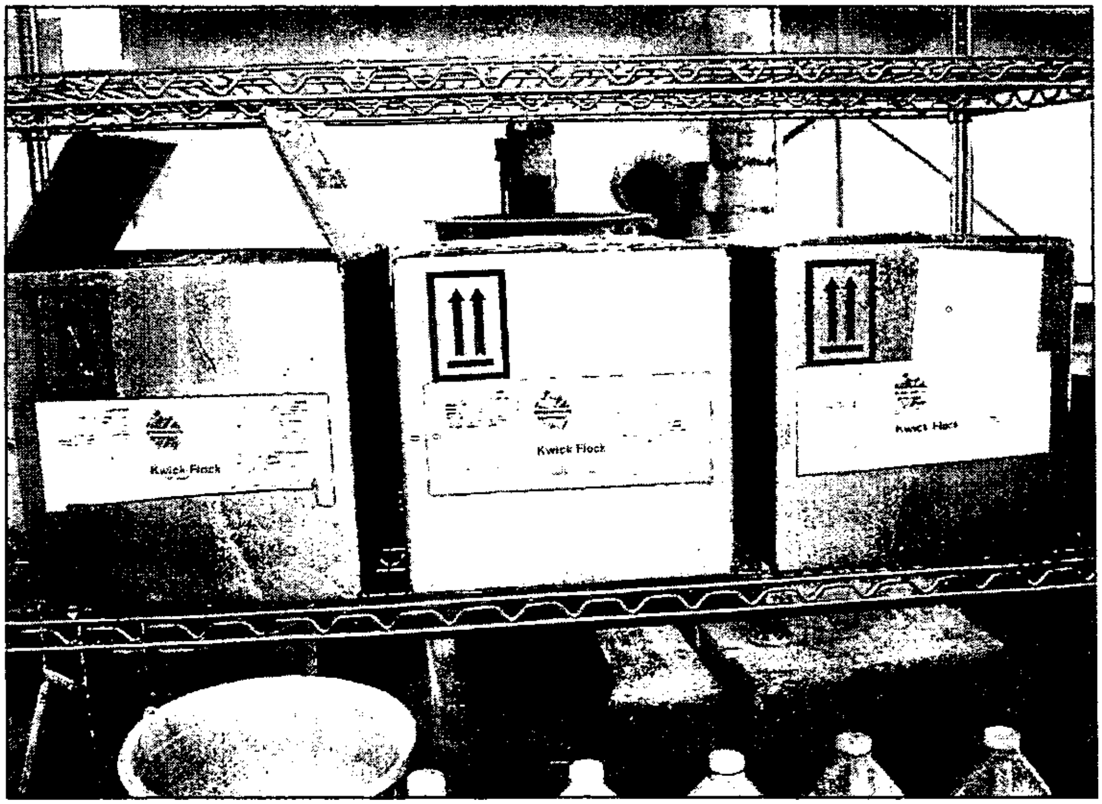
Date: May 21, 2014
Time: 11:35 AM
Direction: SW
Photo by: Eisenbrandt
Exposure #: 034
Comments: View showing the power supply to the solvent stripper.

Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



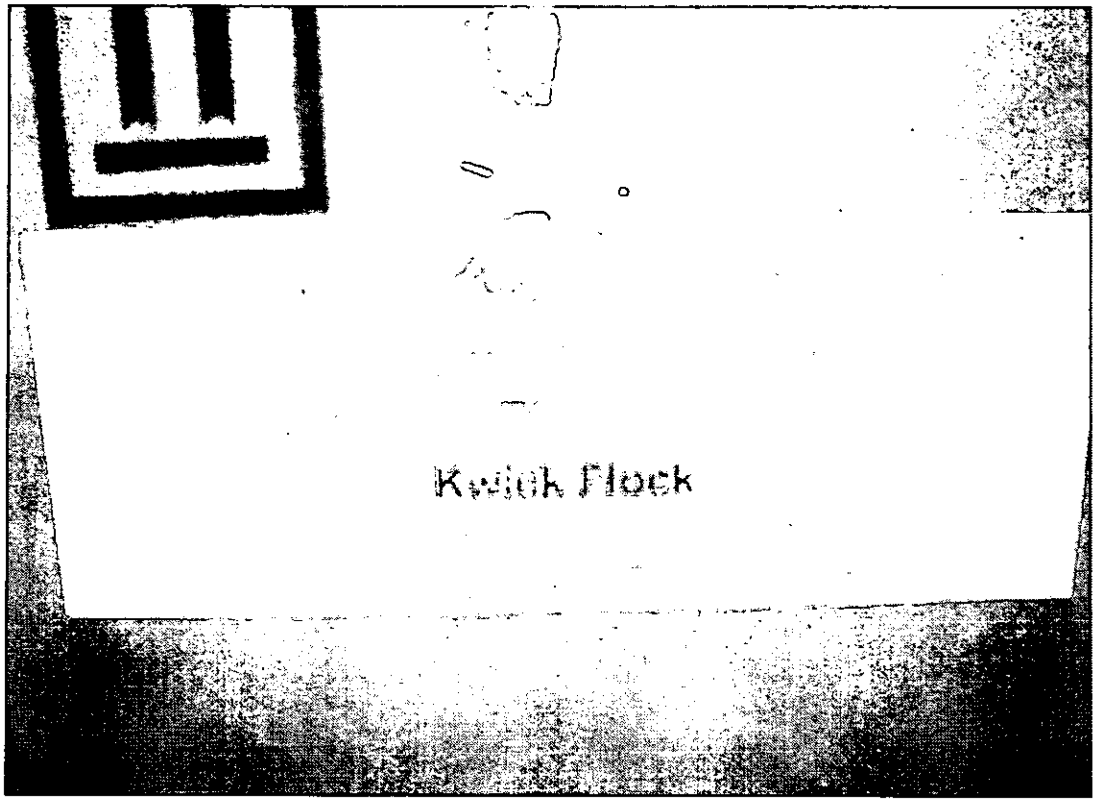
Date: May 21, 2014
Time: 11:36 AM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 035
Comments: Pressurized air fitting and gauge attached to the solvent stripper hopper.



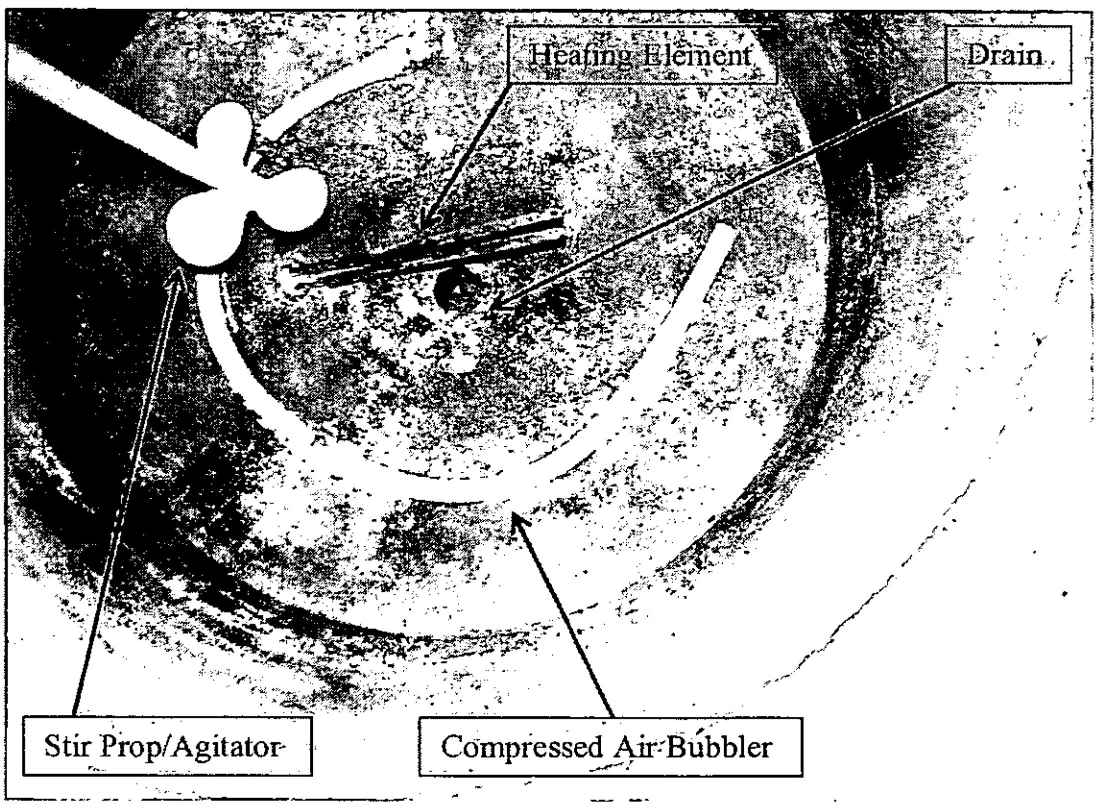
Date: May 21, 2014
Time: 11:37 AM
Direction: S
Photo by: Eisenbrandt
Exposure #: 036
Comments: New Kwick Kleen - Kwick Flock chemical additive.

Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



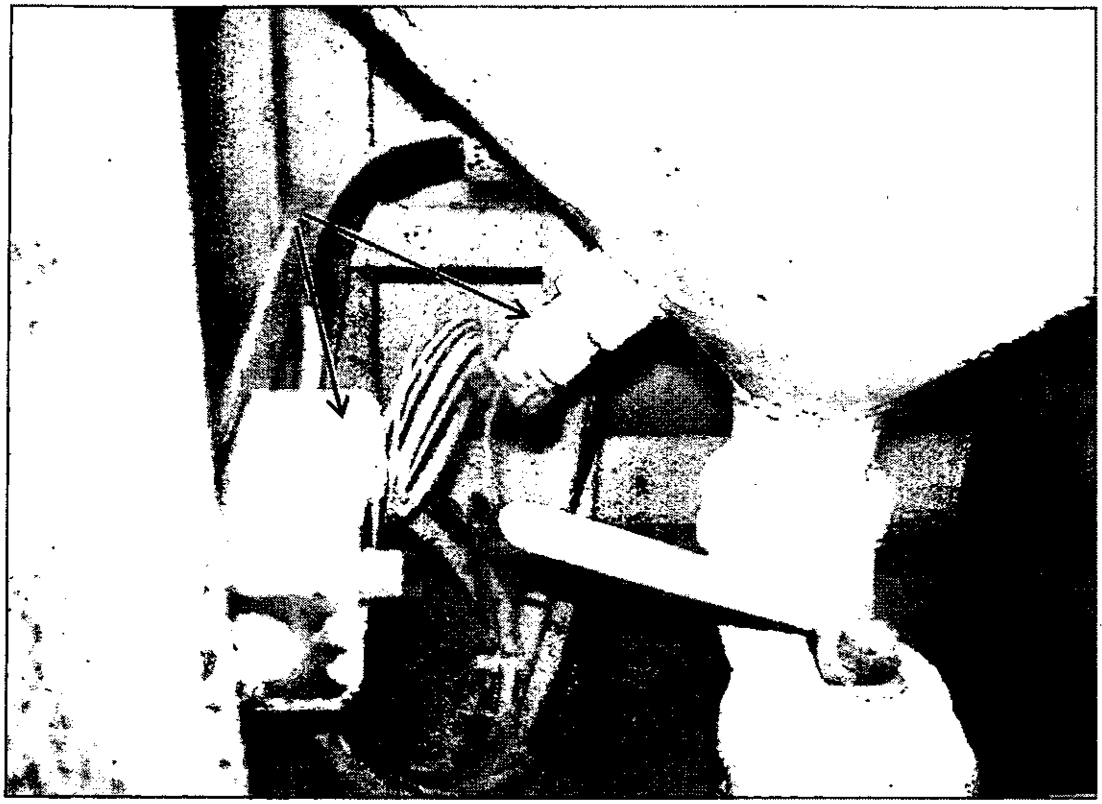
Date: May 21, 2014
Time: 11:37 AM
Direction: S
Photo by: Eisenbrandt
Exposure #: 037
Comments: Close up image of the Kwick Flock label.



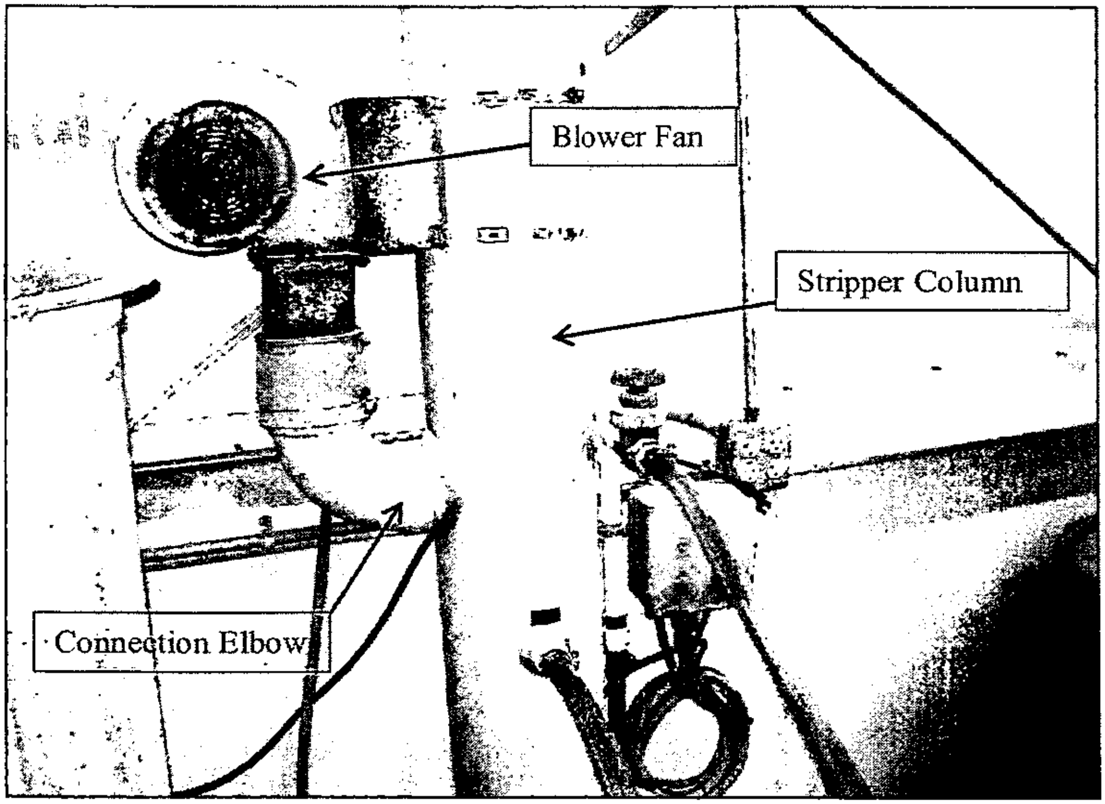
Date: May 21, 2014
Time: 11:38 AM
Direction: W
Photo by: Eisenbrandt
Exposure #: 038
Comments: View inside the solvent stripper hopper.

Photograph File: 0210600007~05212014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



Date: May 21, 2014
Time: 11:40 AM
Direction: S
Photo by: Eisenbrandt
Exposure #: 039
Comments: Hopper wiring to the thermal element.

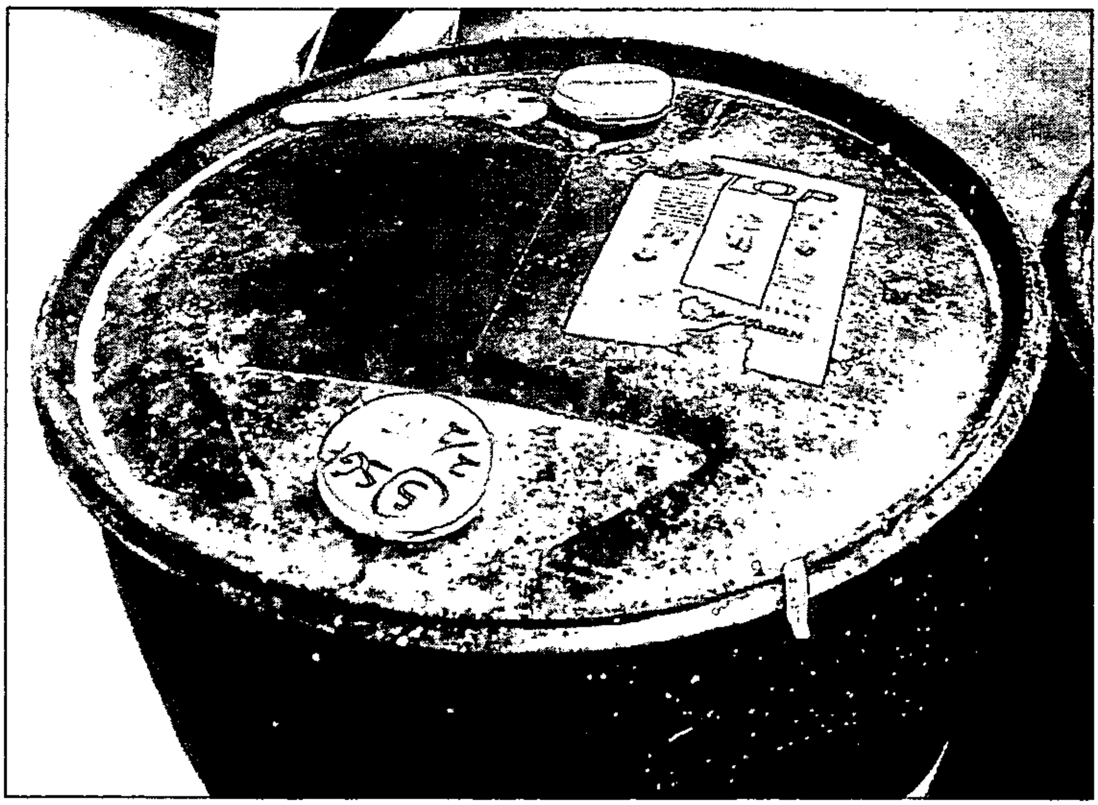


Date: May 21, 2014
Time: 11:46 AM
Direction: S-SW
Photo by: Eisenbrandt
Exposure #: 040
Comments: Blower fan attached to stripper column.

Photograph File: 0210600007~05212014-[Exp. #].jpg

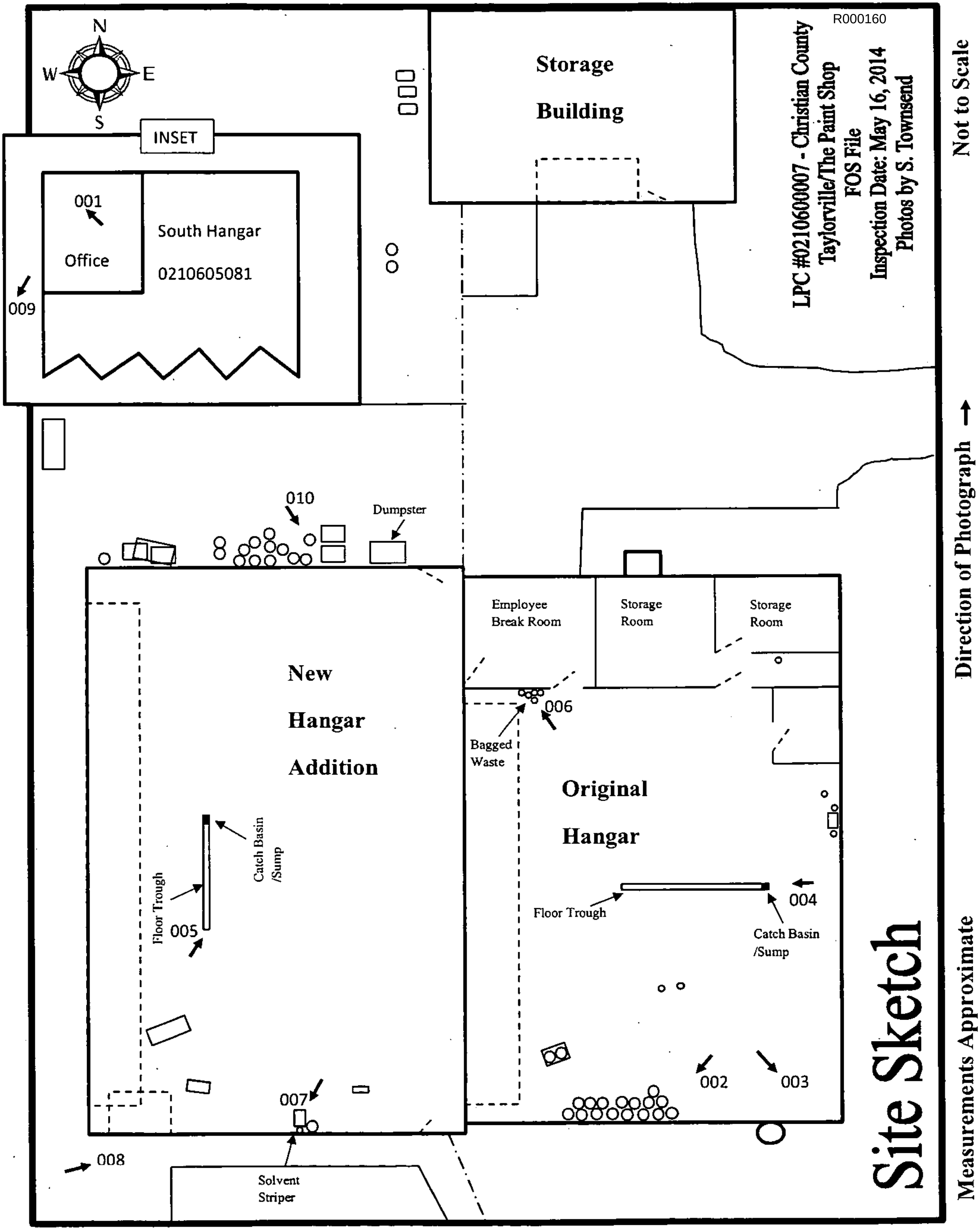
DIGITAL PHOTOGRAPHS

Date: May 21, 2014
Time: 11:51 AM
Direction: NW
Photo by: Eisenbrandt
Exposure #: 041
Comments: Two full 55-gallon drums of solvent stripper.



Date: May 21, 2014
Time: 11:51 AM
Direction: N
Photo by: Eisenbrandt
Exposure #: 042
Comments: The top of each drum was labeled "NEW".

Photograph File: 0210600007~05212014-[Exp. #].jpg



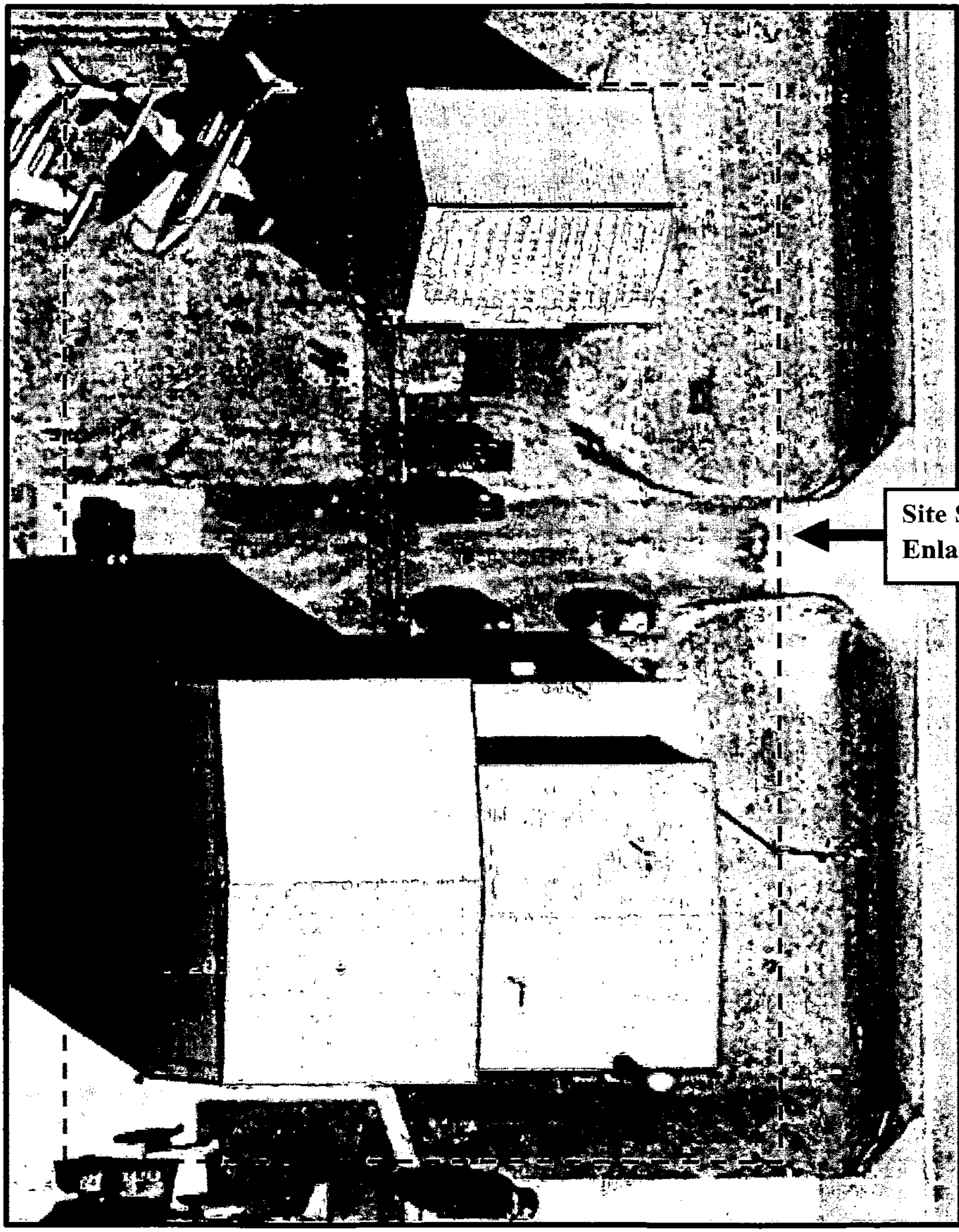
R000160
N
W
E
S
INSET
001
Office
South Hangar
0210605081
009
Storage Building
LPC #0210600007 - Christian County
Taylorville/The Paint Shop
FOS File
Inspection Date: May 16, 2014
Photos by S. Townsend
Not to Scale
Direction of Photograph
010
Dumpster
Employee Break Room
Storage Room
Storage Room
New Hangar Addition
006
Bagged Waste
Original Hangar
Catch Basin /Sump
Floor Trough
005
Floor Trough
004
Catch Basin /Sump
007
002
003
008
Solvent Striper
Site Sketch
Measurements Approximate

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

Aerial Image

LPC #0210600007 - Christian County
Taylorville/The Paint Shop
FOS File
Inspection Date: May 16, 2014

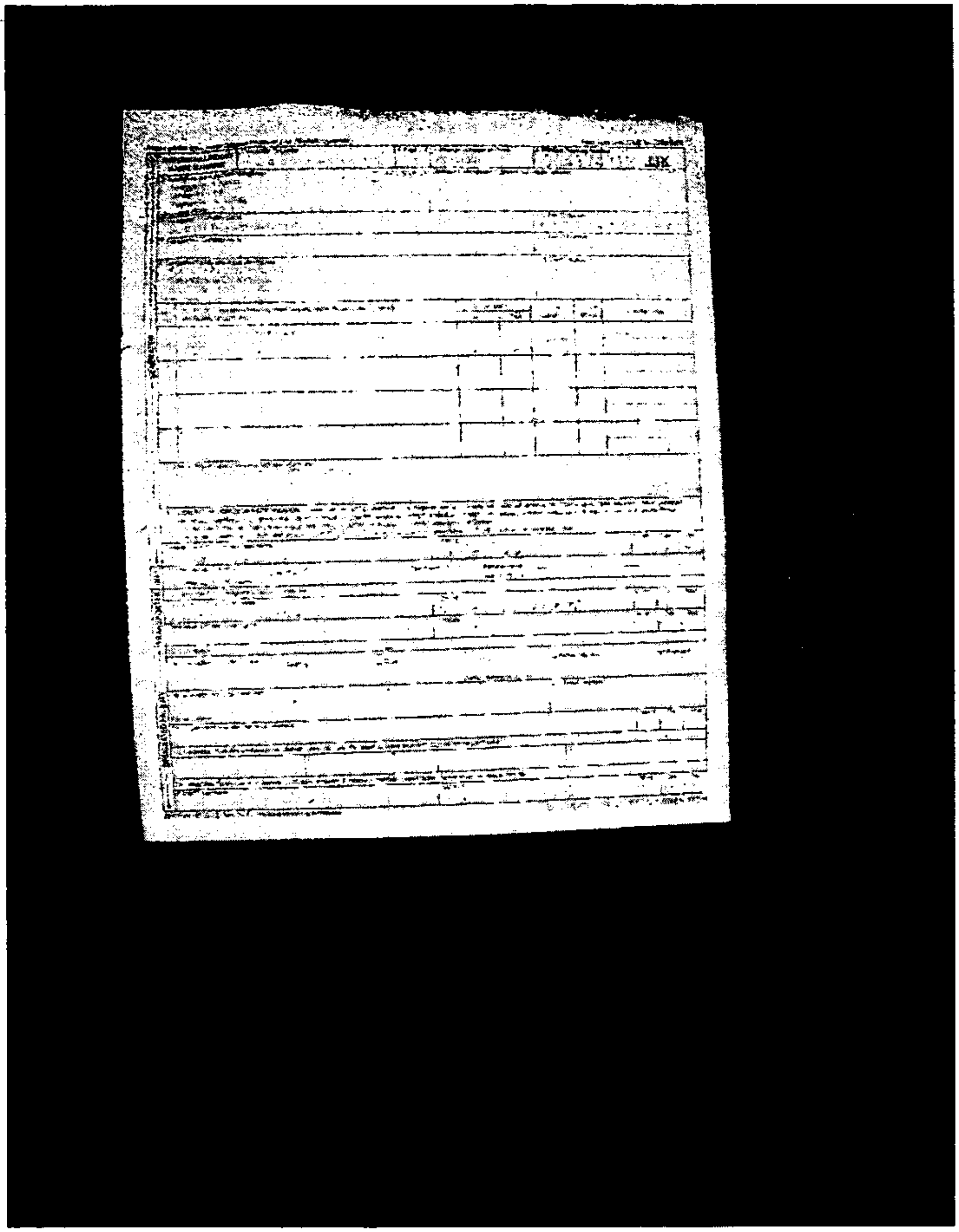
N W E S



Site Sketch Enlargement

DIGITAL PHOTOGRAPHS

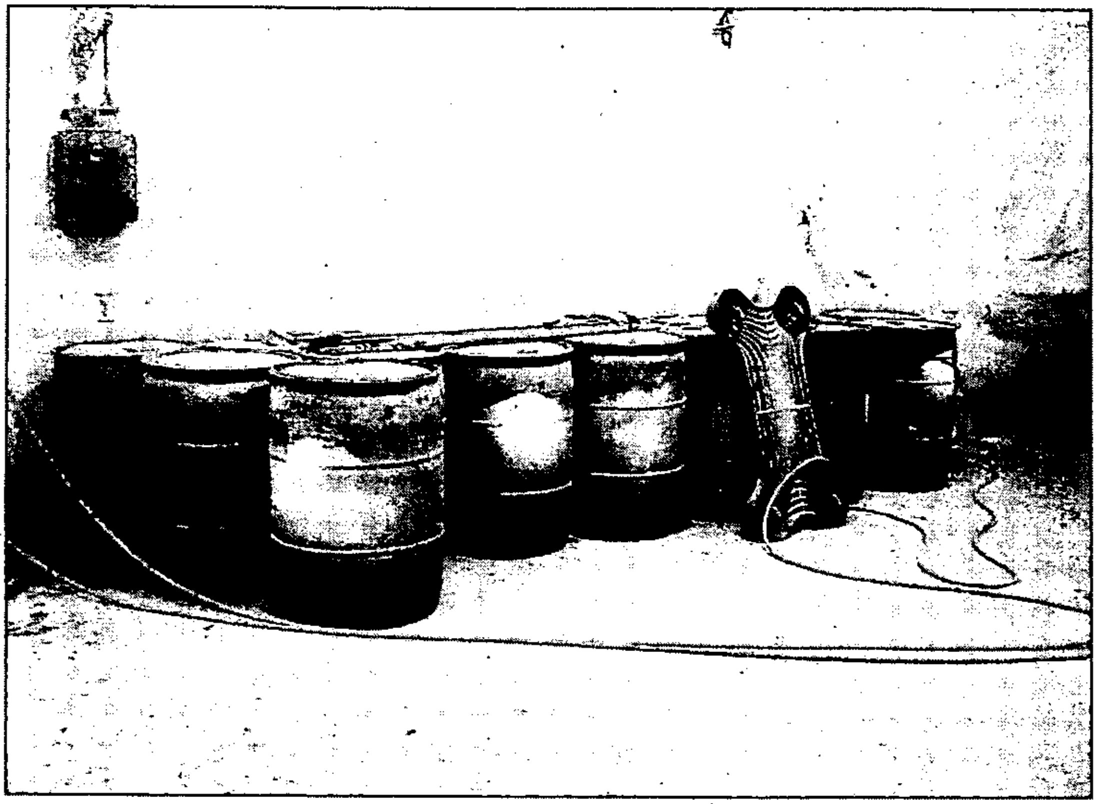
File Names: 0210600007-05162014-[Exp. #].jpg



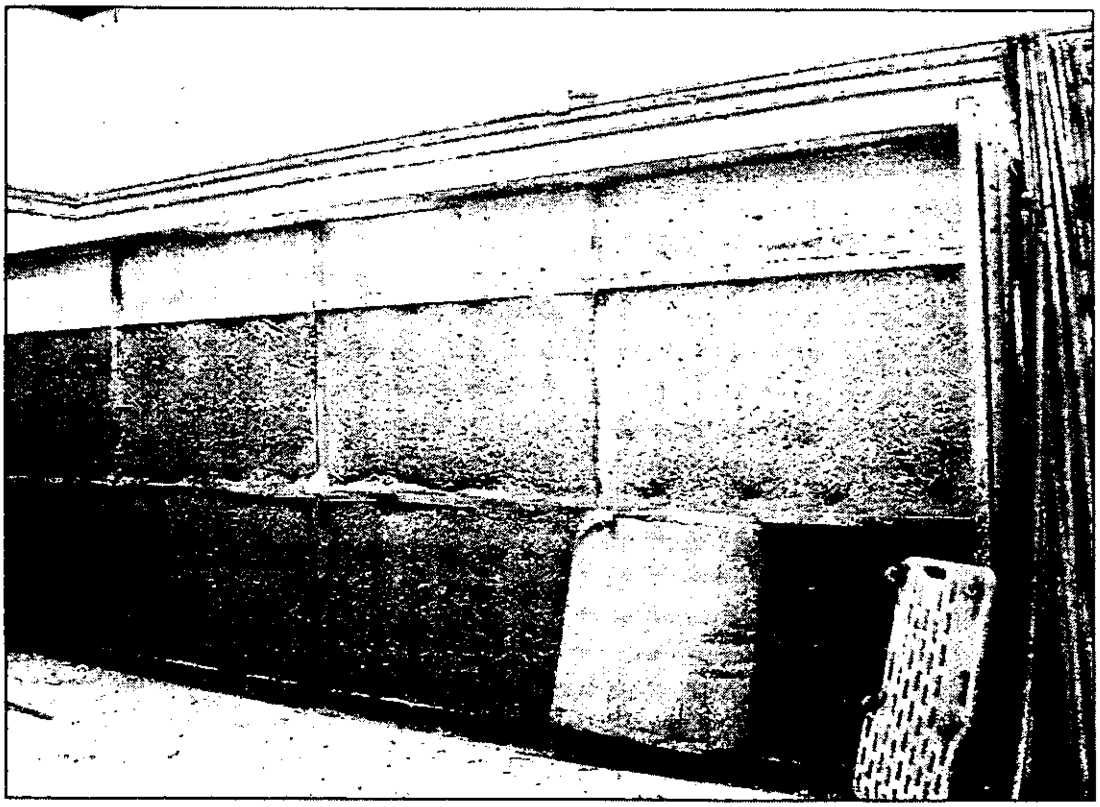
Date: May 16, 2014
Time: 11:25
Direction: N (downward)
Photo by: S. Townsend
Exposure #: 001
Comments:
Photo of manifested dated January 4, 2010, used for shipment of waste solids from stripping planes and treated waste-water containing stripping agent and paint solids.

DIGITAL PHOTOGRAPHS

File Names: 0210600007-05162014-[Exp. #].jpg



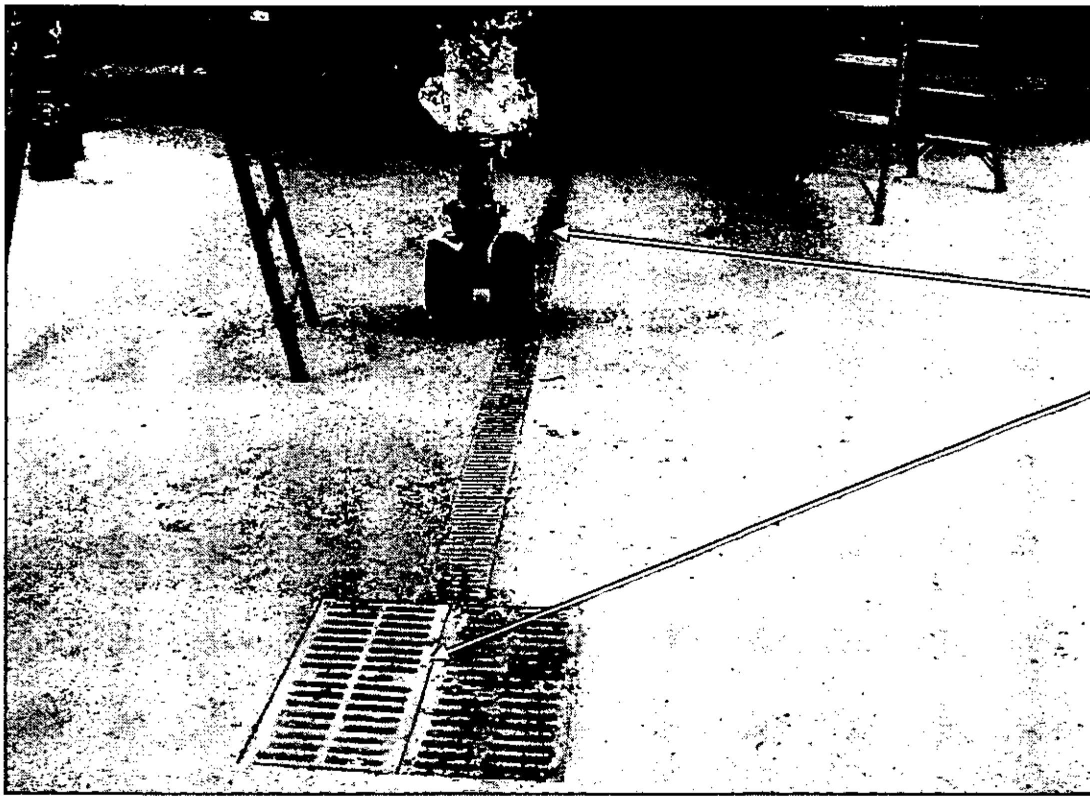
Date: May 16, 2014
Time: 11:57
Direction: S-SW
Photo by: S. Townsend
Exposure #: 002
Comments:
14 drums containing waste rinse-water to be treated, one drum containing raw material product, and one drum containing waste solids.



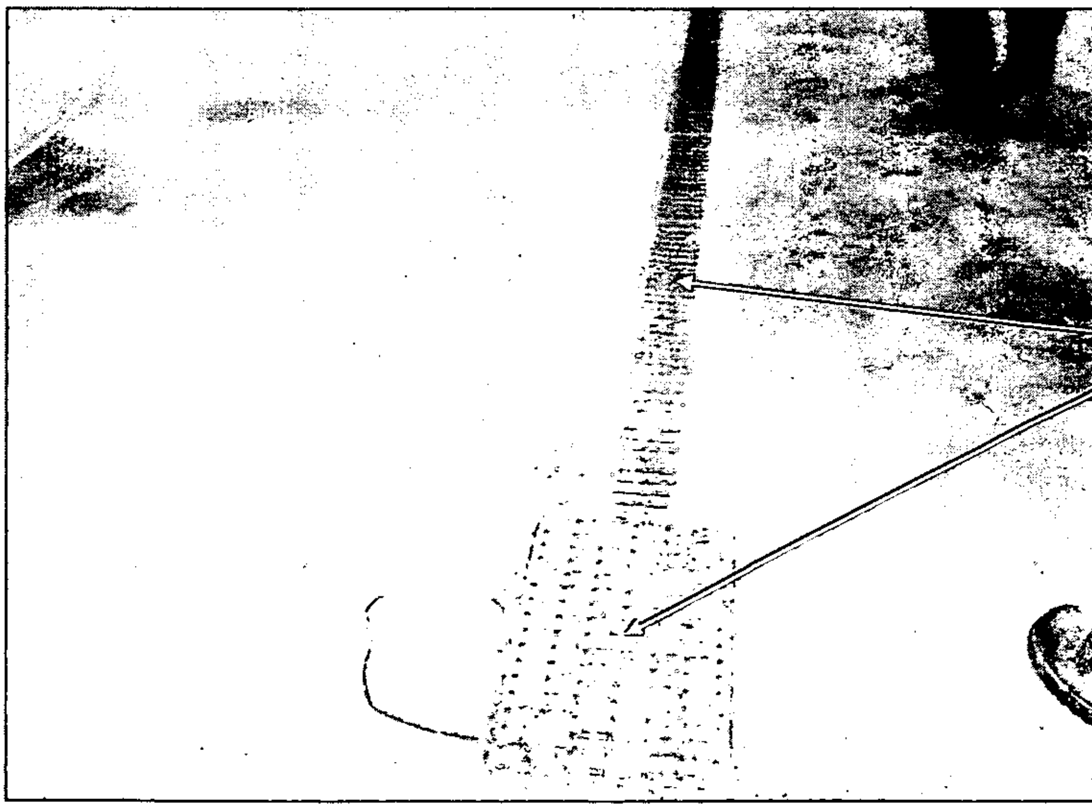
Date: May 16, 2014
Time: 11:59
Direction: S-SE
Photo by: S. Townsend
Exposure #: 003
Comments:
Paint booth filters.

DIGITAL PHOTOGRAPHS

File Names: 0210600007-05162014-[Exp. #].jpg



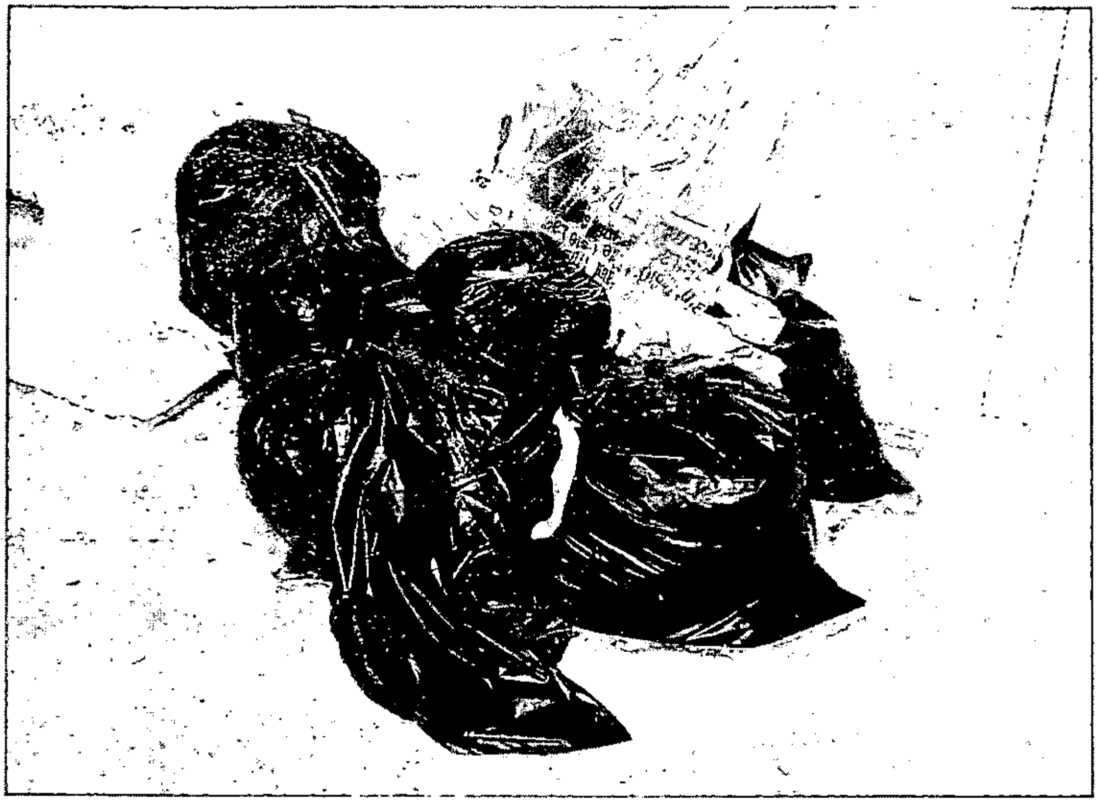
Date: May 16, 2014
Time: 12:00
Direction: W
Photo by: S. Townsend
Exposure #: 004
Comments:
East floor trough said to go to
sump from where stripper/rinse-water are accumulated prior to being pumped to drums.



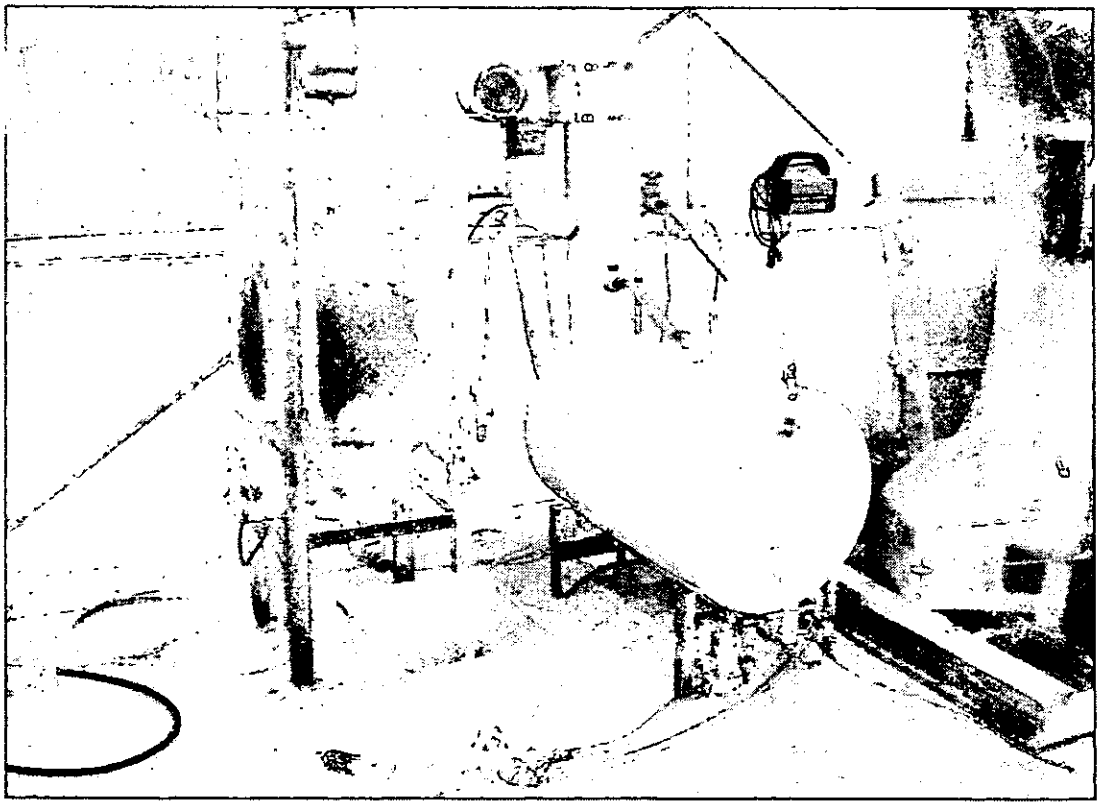
Date: May 16, 2014
Time: 12:14
Direction: S
Photo by: S. Townsend
Exposure #: 005
Comments:
West floor
trough said to go to
sump from where stripper/rinse-water are accumulated prior to being pumped to drums.

DIGITAL PHOTOGRAPHS

File Names: 0210600007-05162014-[Exp. #].jpg



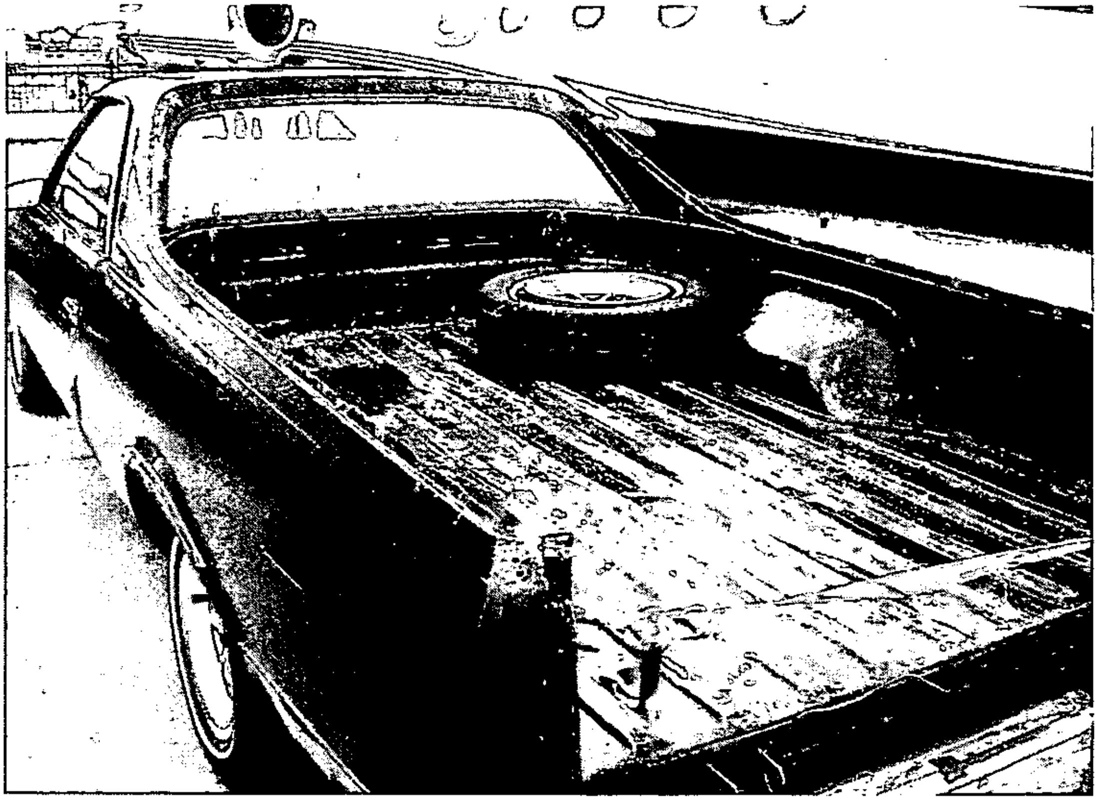
Date: May 16, 2014
Time: 12:16
Direction: N-NW
Photo by: S. Townsend
Exposure #: 006
Comments:
Bags said to contain plastic sheeting contaminated with paint chips/stripper.



Date: May 16, 2014
Time: 12:37
Direction: S-SW
Photo by: S. Townsend
Exposure #: 007
Comments:
Kwik Kleen ™ waste-water treatment unit at what was described as a new location.

DIGITAL PHOTOGRAPHS

File Names: 0210600007-05162014-[Exp. #].jpg



Date: May 16, 2014
Time: 12:46
Direction: E
Photo by: S. Townsend
Exposure #: 008
Comments:
El Camino #1 parked near jet. Bed was empty.

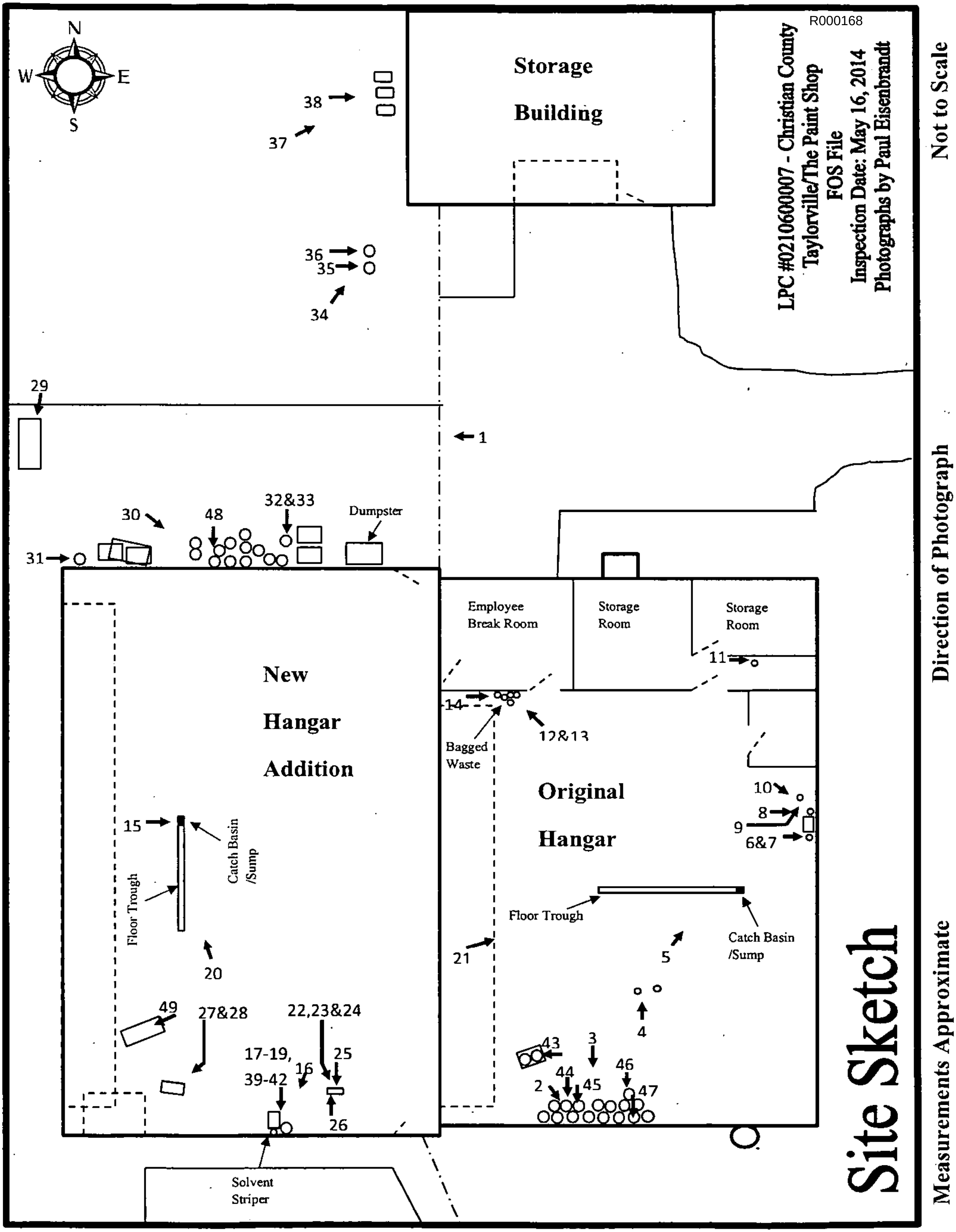
Date: May 16, 2014
Time: 12:49
Direction: SW
Photo by: S. Townsend
Exposure #: 009
Comments:
El Camino #2 parked near boat. Bed was empty.

DIGITAL PHOTOGRAPHS

File Names: 0210600007-05162014-[Exp. #].jpg

Date: May 16, 2014
Time: 14:43
Direction: S
Photo by: S. Townsend
Exposure #: 010
Comments:
Drums outside paint shop said to contain rain water
and
stripper/paint waste.

R000168



LPC #0210600007 - Christian County
Taylorville/The Paint Shop
FOS File
Inspection Date: May 16, 2014
Photographs by Paul Eisenbrandt
Not to Scale
Direction of Photograph
Measurements Approximate
Site Sketch
N
W
E
S
Storage Building
New Hangar Addition
Original Hangar
Employee Break Room
Storage Room
Storage Room
Dumpster
Bagged Waste
Floor Trough
Catch Basin /Sump
Floor Trough
Catch Basin /Sump
Solvent Striper
1
2
3
4
5
6&7
8
9
10
11
12&13
14
15
16
17-19, 39-42
20
21
22,23&24
25
26
27&28
29
30
31
32&33
34
35
36
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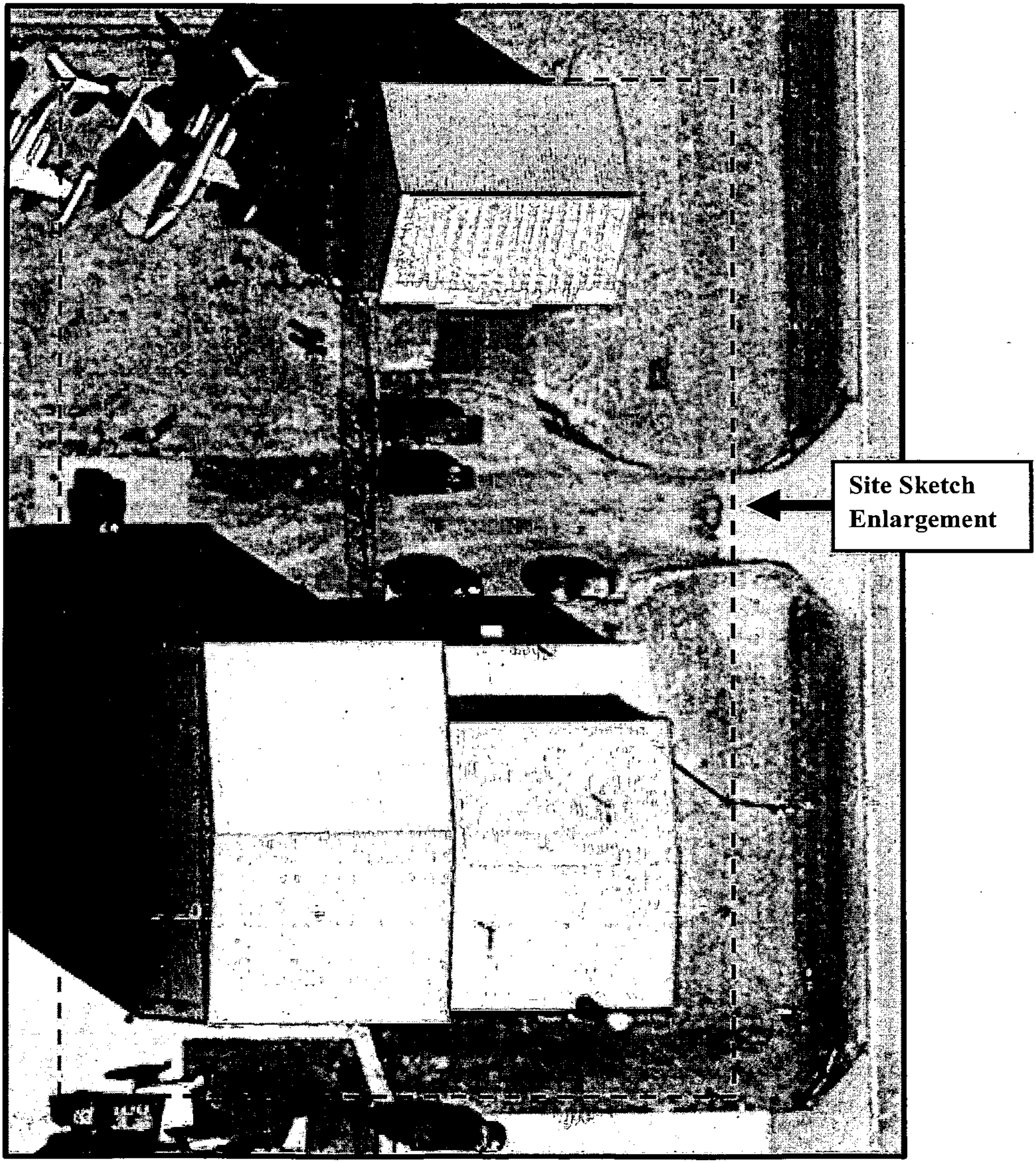
48
49

R000169

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

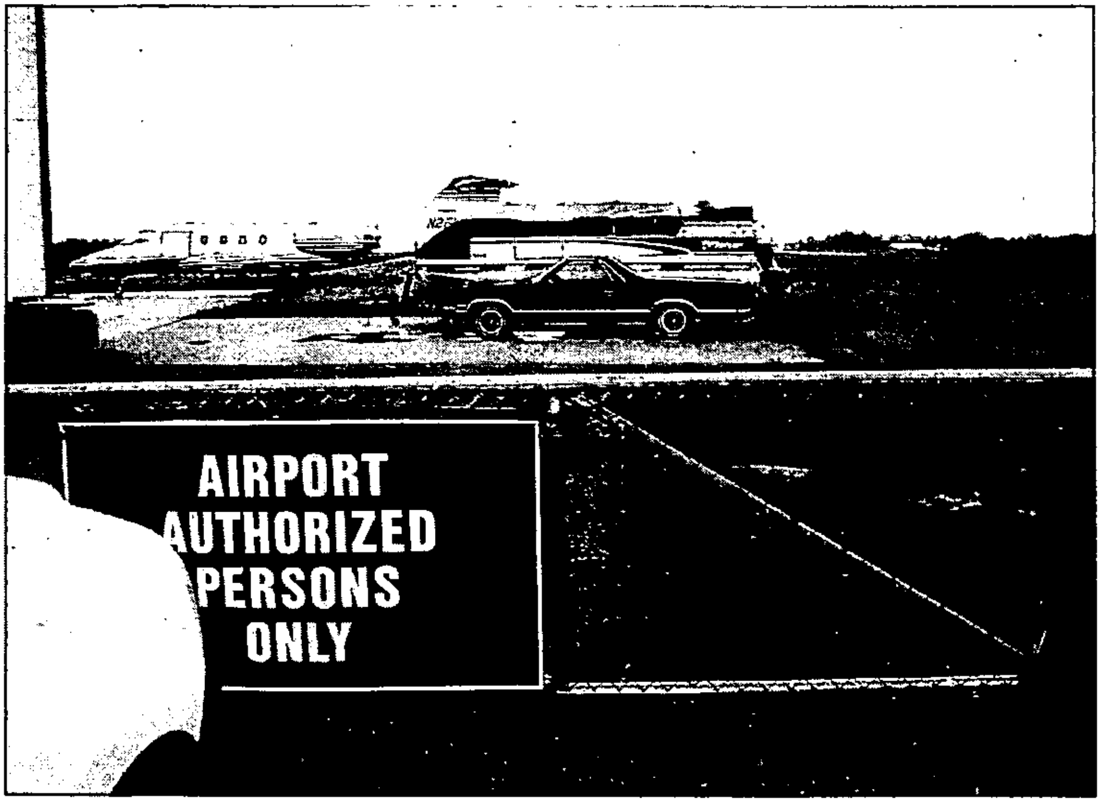
Aerial Image

LPC #0210600007 - Christian County
Taylorville/The Paint Shop
FOS File
Inspection Date: May 16, 2014



R000170

DIGITAL PHOTOGRAPHS

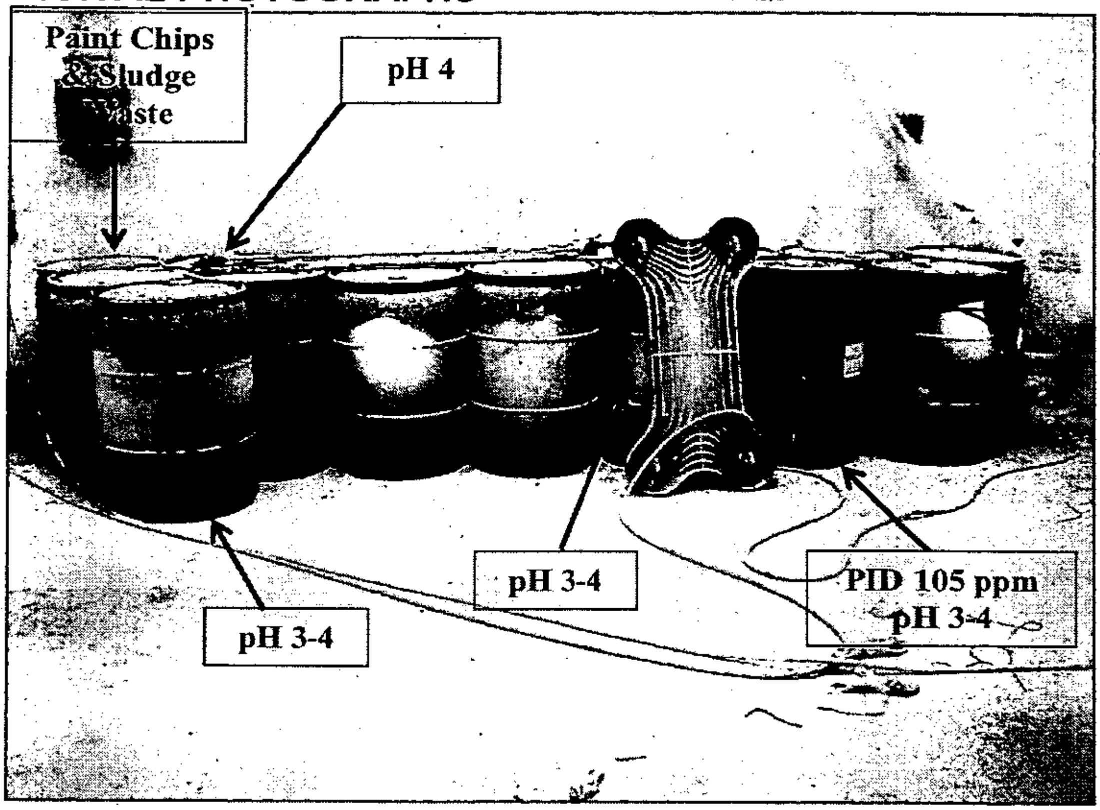


Date: May 16, 2014
Time: 9:15 AM
Direction: W
Photo by: Eisenbrandt
Exposure #: 001
Comments: Signage posted on gate between the two buildings.

Date: May 16, 2014
Time: 11:55 AM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 002
Comments: Mr. Robert Brandis claimed this 55-gallon drum contained the acid paint remover product. Later during the inspection, it was determined by Mr. Robert Brandis to contain paint stripper rinse water.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



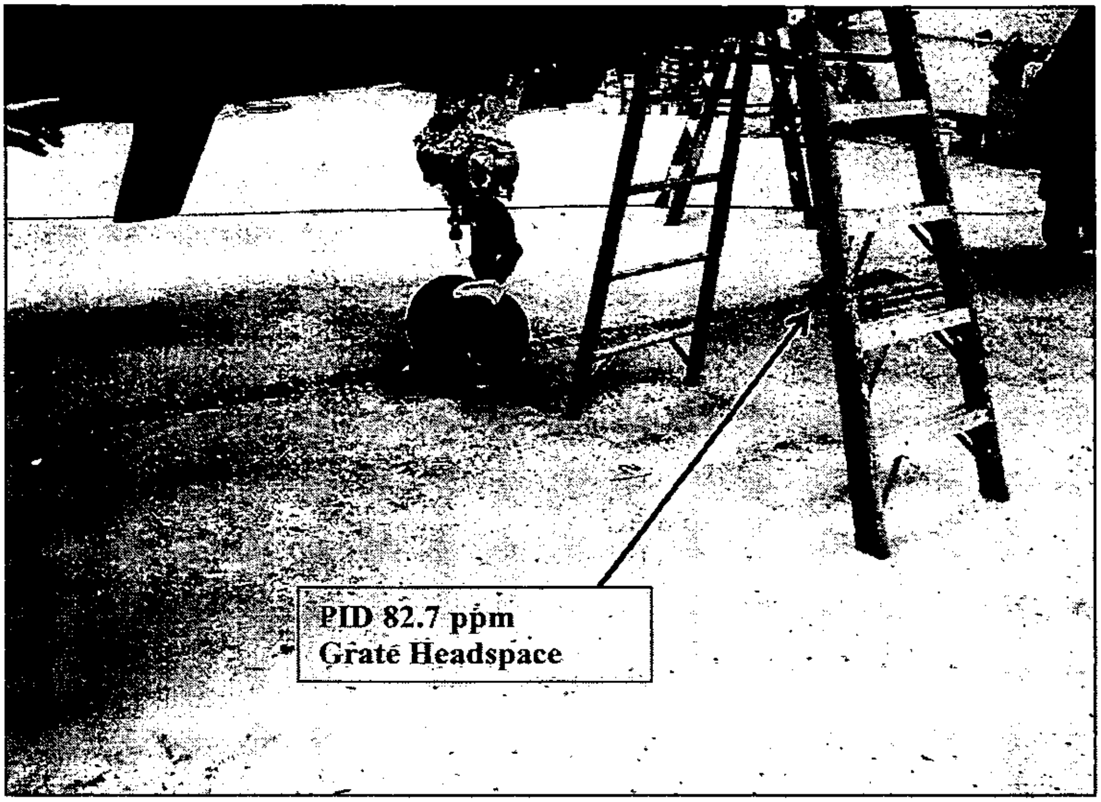
Date: May 16, 2014
Time: 11:56 AM
Direction: S
Photo by: Eisenbrandt
Exposure #: 003
Comments: Sixteen (16) 55-gallon drums stored along the south wall of the hangar. Mr. Robert Brandis stated the drum at the far left side (see arrow) contained paint chips and sludge. The other fifteen (15) full drums contained paint stripper rinse water.

PID reading from drum headspace, and field pH of drum fluids are noted.

Date: May 16, 2014
Time: 11:56 AM
Direction: N
Photo by: Eisenbrandt
Exposure #: 004
Comments: A full 5-gallon container of Methyl Ethyl Ketone (MEK) and an empty 5-gallon container of MEK turned upside down.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



Date: May 16, 2014
Time: 11:59 AM
Direction: NE
Photo by: Eisenbrandt
Exposure #: 005
Comments: Floor trough and catch basin/sump on the east side of the hangar.

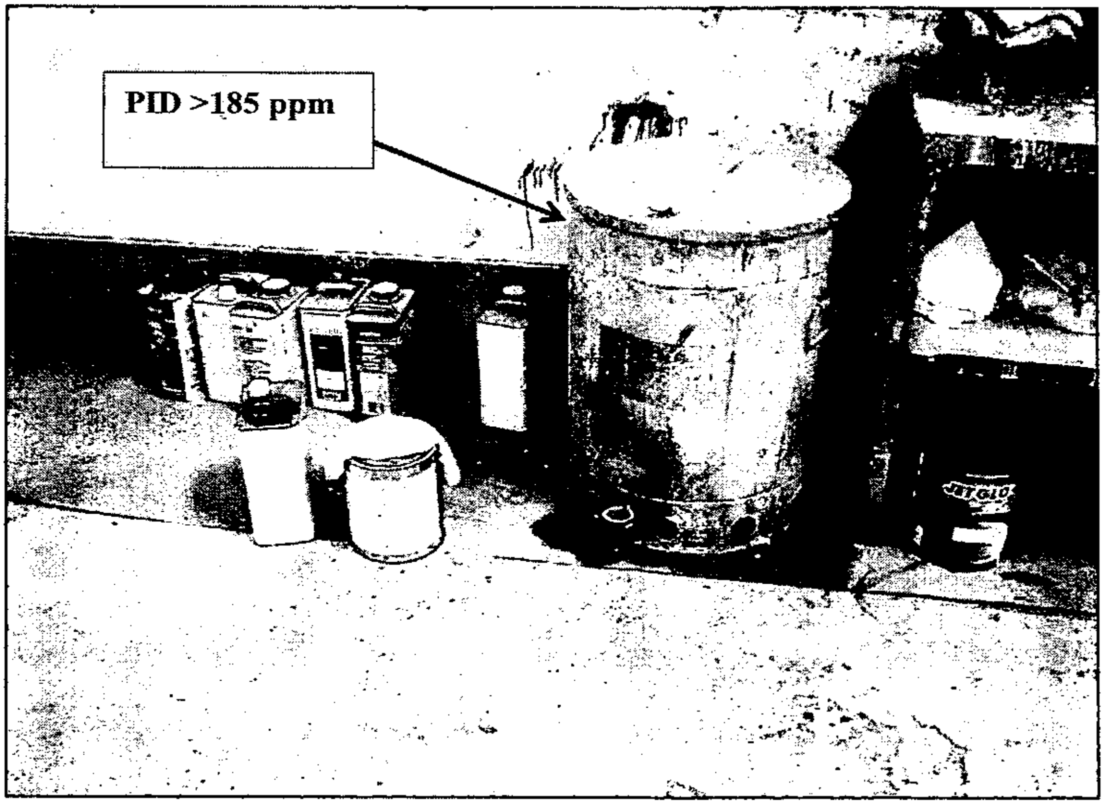
PID reading from grate headspace noted.

Date: May 16, 2014
Time: 12:02 PM
Direction: E
Photo by: Eisenbrandt
Exposure #: 006
Comments: An open top container labeled MEK containing orange-red liquid along the east wall of the hangar.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS

Date: May 16, 2014
Time: 12:02 PM
Direction: E
Photo by: Eisenbrandt
Exposure #: 007
Comments: View inside container seen in Photograph 006. Liquid and solid wastes were mixed in the bottom 1/5 of the container.



Date: May 16, 2014
Time: 12:03 PM
Direction: E
Photo by: Eisenbrandt
Exposure #: 008
Comments: Flammable waste container and chemicals along the east wall of the hangar.

PID reading from container headspace noted.

Photograph File: 0210600007-05162014-[Exp. #].jpg

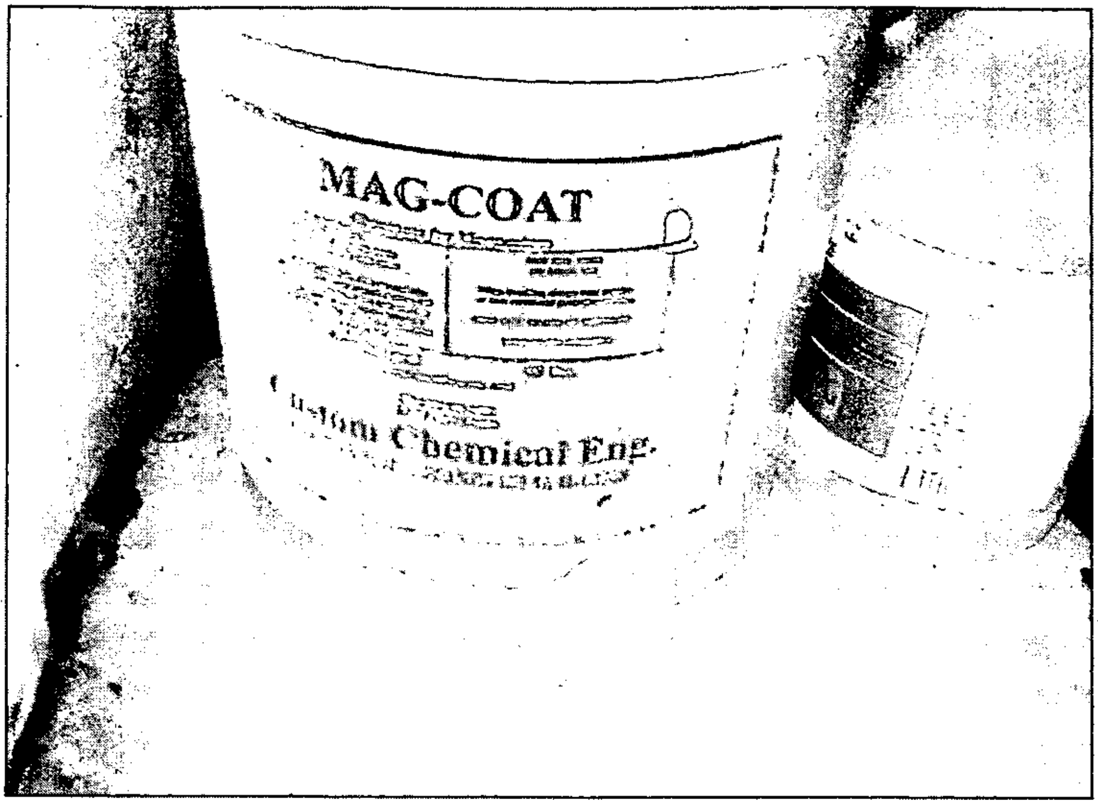
DIGITAL PHOTOGRAPHS

Date: May 16, 2014
Time: 12:04 PM
Direction: NE
Photo by: Eisenbrandt
Exposure #: 009
Comments: Chemicals along the east wall of the hangar.

Date: May 16, 2014
Time: 12:05 PM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 010
Comments: A full 5-gallon container of MEK.

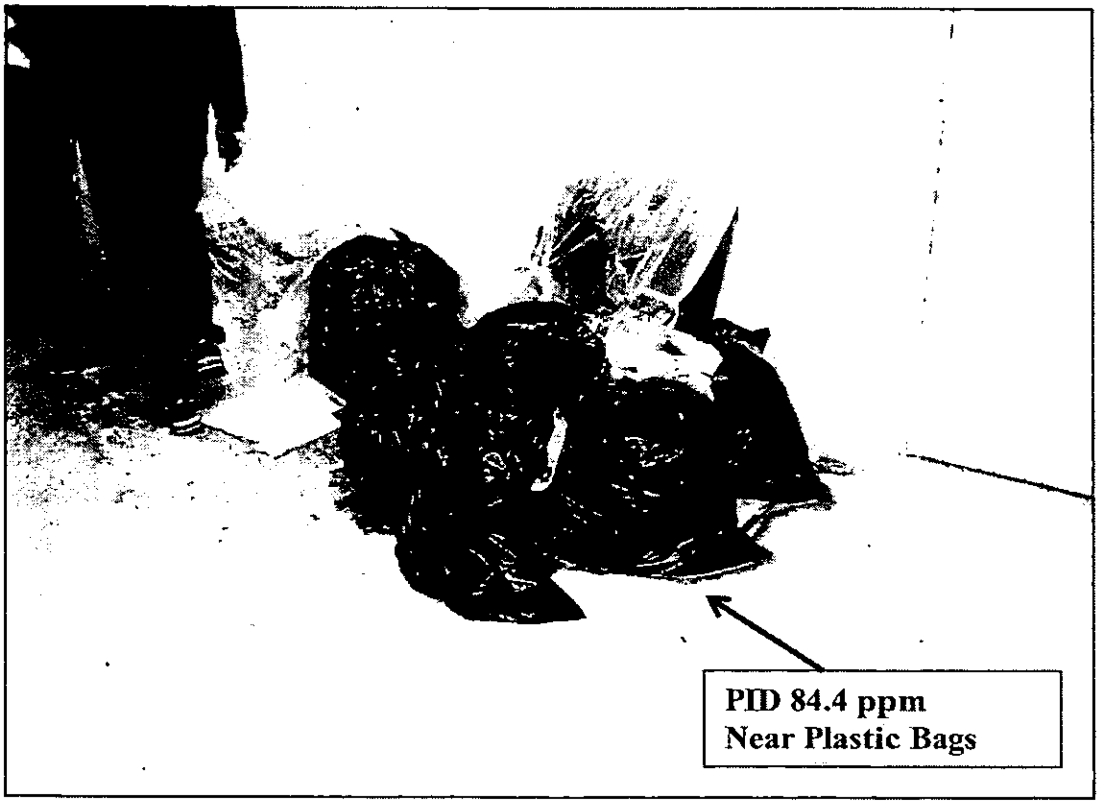
Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



Date: May 16, 2014
Time: 12:06 PM
Direction: E
Photo by: Eisenbrandt
Exposure #: 011
Comments: Label on a 5-gallon container of Mag-Coat an anti-corrosive coating for magnesium.

1-gallon container of DX533 aluminum cleaner to the right side of the photograph.



Date: May 16, 2014
Time: 12:09 PM
Direction: NW
Photo by: Eisenbrandt
Exposure #: 012
Comments: At least nine (9) bags of methylene chloride/acid-based paint stripper waste. Mr. Robert Brandis stated these bags contain plastic sheeting, paint chips & sludge, and stripper waste from beneath an aircraft during the paint removal process.

PID reading from near plastic bags noted.

Photograph File: 0210600007~05162014-[Exp. #].jpg

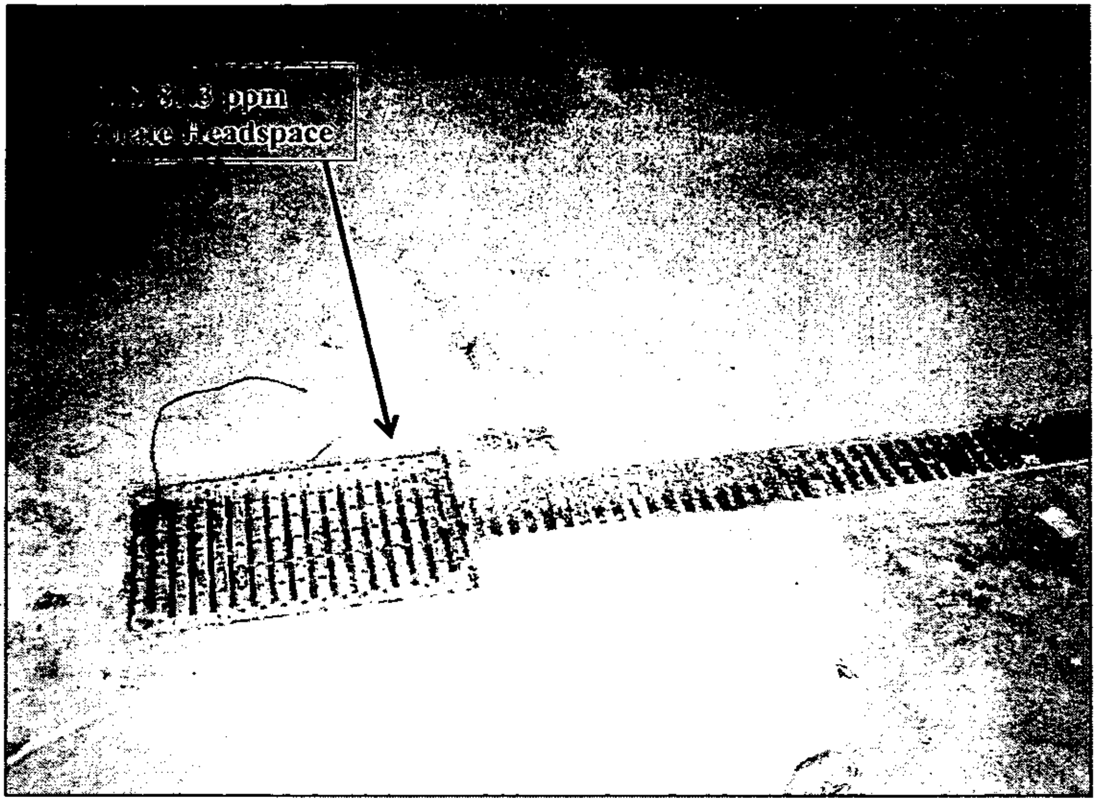
DIGITAL PHOTOGRAPHS

Date: May 16, 2014
Time: 12:09 PM
Direction: NW
Photo by: Eisenbrandt
Exposure #: 013
Comments: The corrosive paint stripper was leaking out of the bags onto the concrete floor.

Date: May 16, 2014
Time: 12:10 PM
Direction: E
Photo by: Eisenbrandt
Exposure #: 014
Comments: Previous bags of corrosive paint stripper residue have scaled (damaged) the concrete surface around the bagged waste.

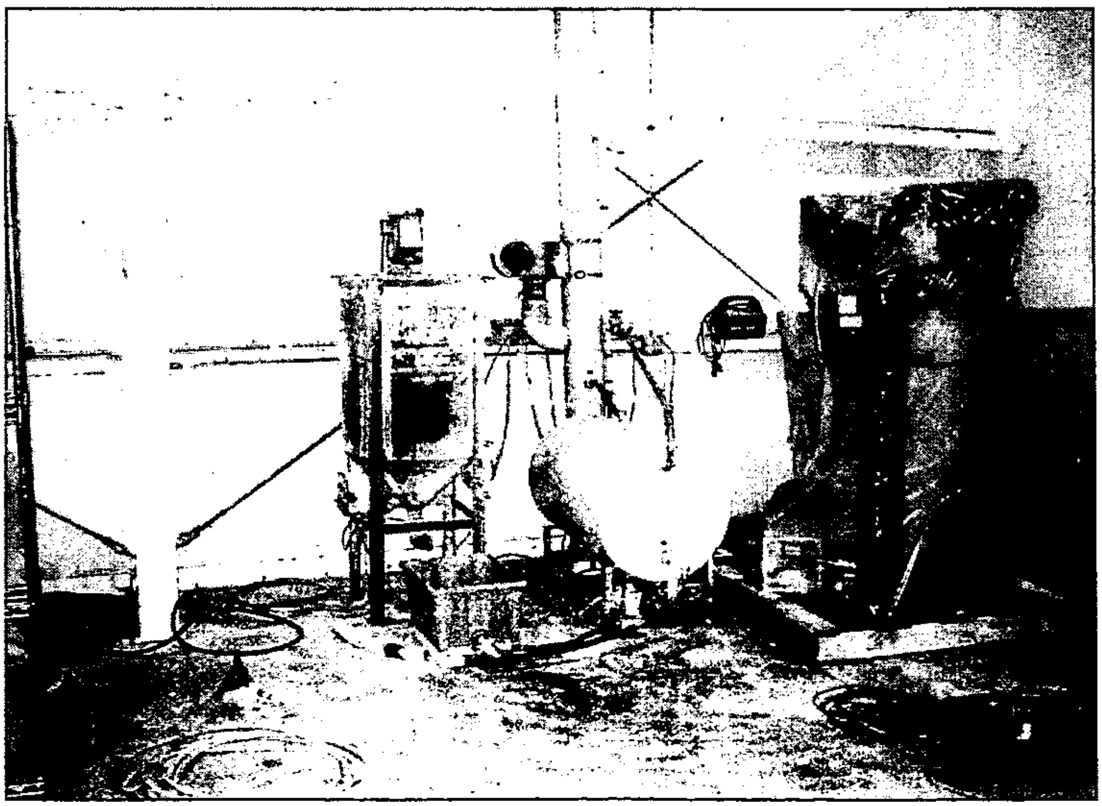
Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



Date: May 16, 2014
Time: 12:13 PM
Direction: E
Photo by: Eisenbrandt
Exposure #: 015
Comments: Floor trough and catch basin/sump on the west side of the hangar.

PID reading from grate headspace noted.

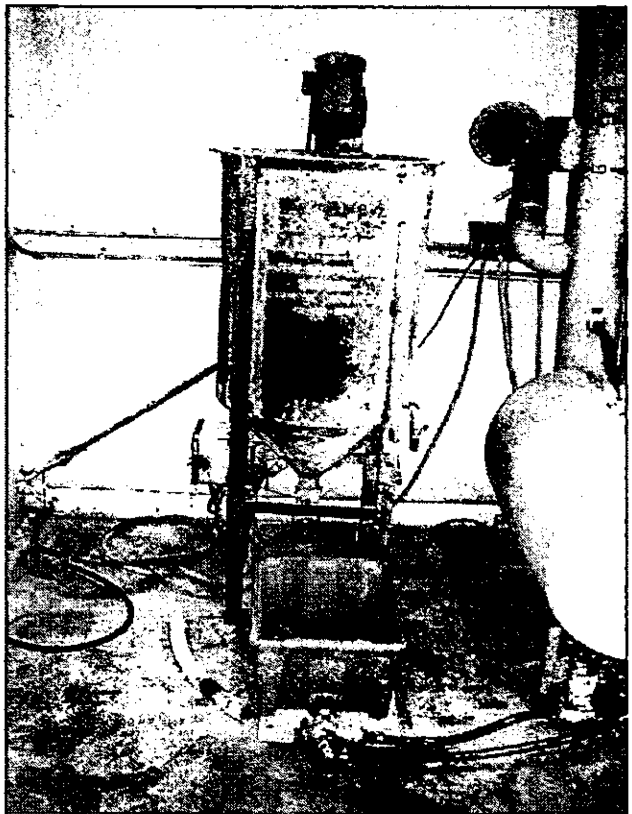


Date: May 16, 2014
Time: 12:31 PM
Direction: S-SW
Photo by: Eisenbrandt
Exposure #: 016
Comments: A Kwick Kleen Solvent Stripper treatment unit.

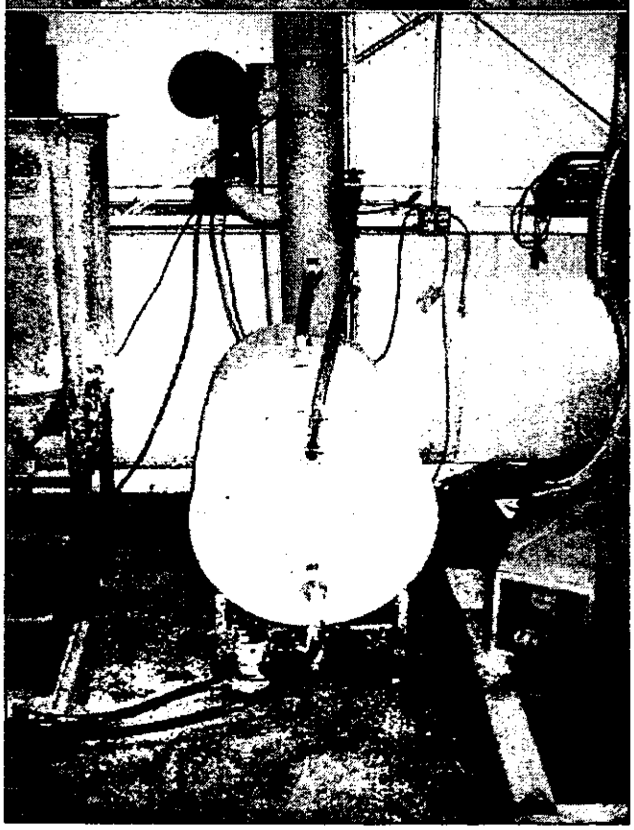
Note the new Ingersoll Rand (IR) air compressor wrapped on a shipping pallet to the right of the solvent stripper.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



Date: May 16, 2014
Time: 12:31 PM
Direction: S
Photo by: Eisenbrandt
Exposure #: 017
Comments: Robert Brandis claimed rinse water is pumped into the elevated hopper that houses an agitation mixer and then pH and flocculent added. The rinse water is then slowly discharge into the gray plastic bin lined with a cloth sediment filter. From there, the rinse water is pumped into the poly 55-gallon drum seen to the right of the photograph.

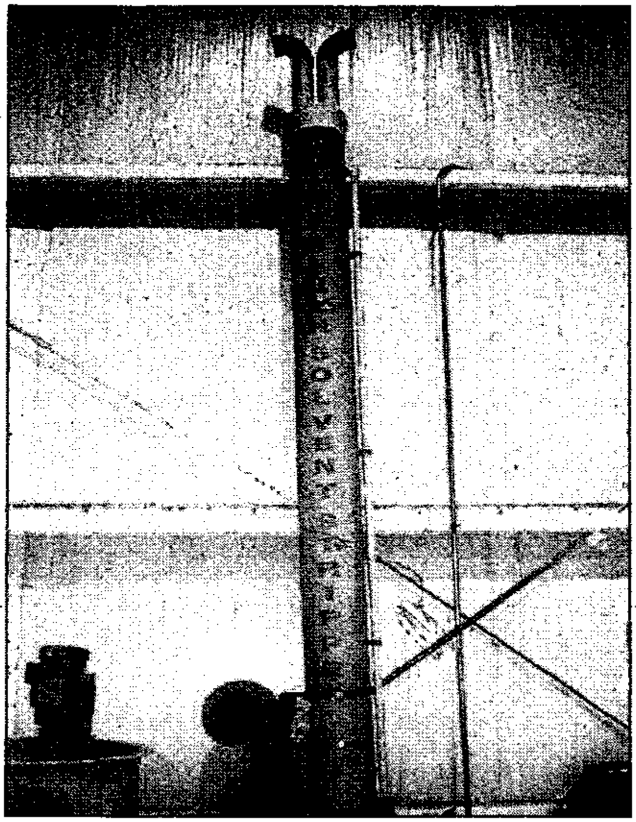


Date: May 16, 2014
Time: 12:31 PM
Direction: S
Photo by: Eisenbrandt
Exposure #: 018
Comments: Reportedly the holding drum is attached to the column stripper behind the drum. Rinse water is cycled through the column stripper. The rinse water is injected near the top of the column. Near the bottom, air is forced up through the column. The volatile components are "stripped" off the water molecules and carried out the top.

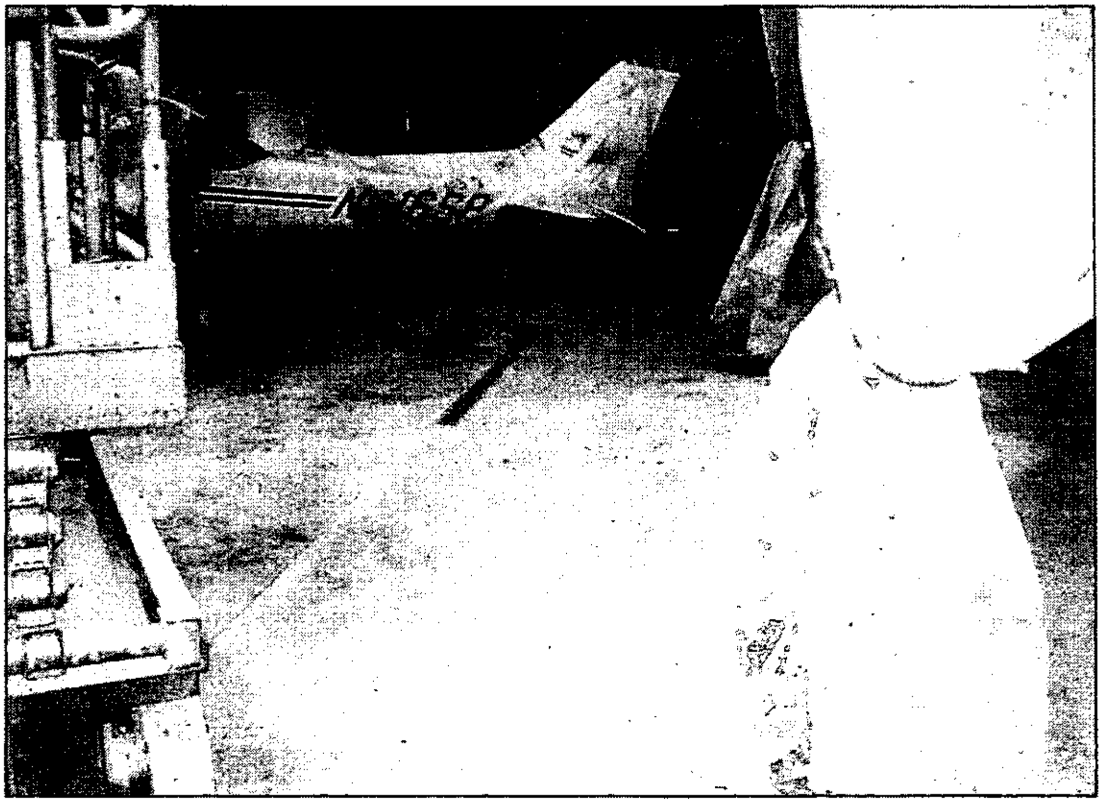
Photograph File: 0210600007~05162014-[Exp. #].jpg

R000179

DIGITAL PHOTOGRAPHS



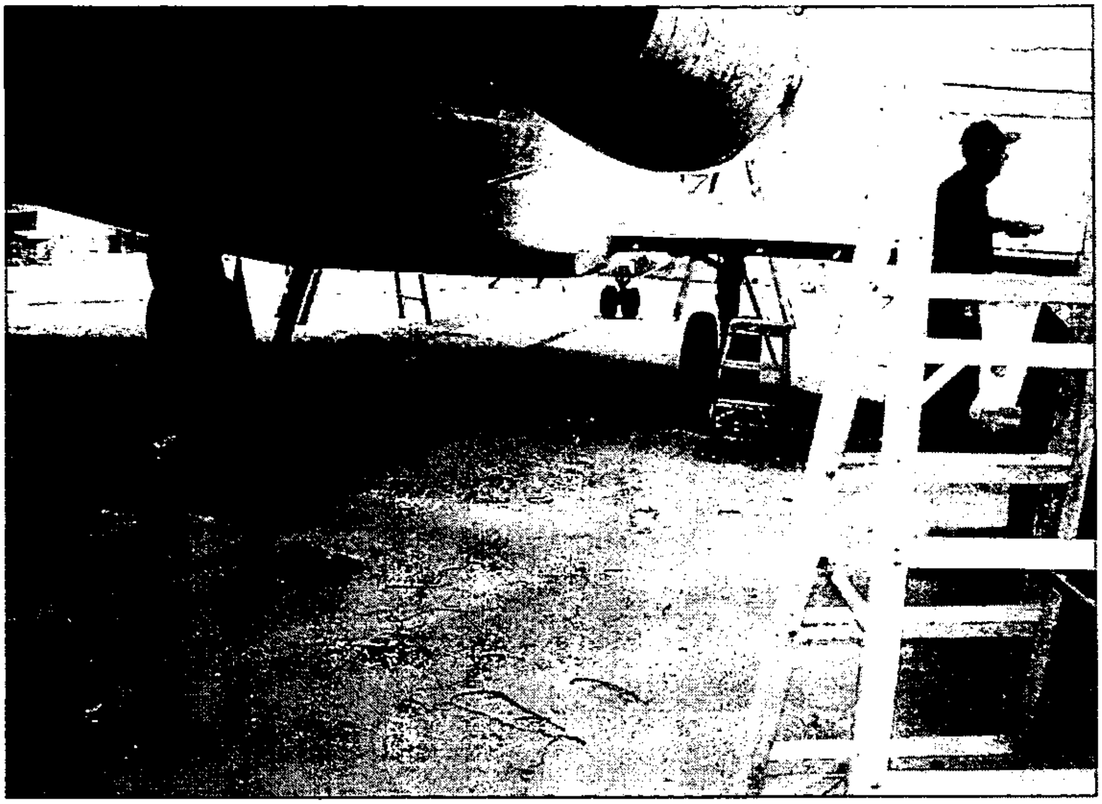
Date: May 16, 2014
Time: 12:31 PM
Direction: S
Photo by: Eisenbrandt
Exposure #: 019
Comments: Reportedly volatile components are stripped out of the solution, rise to the top of the column stripper, and vented off into the hangar.



Date: May 16, 2014
Time: 12:31 PM
Direction: N-NW
Photo by: Eisenbrandt
Exposure #: 020
Comments: Another view of the floor trough and catch basin/sump on the west side of the new hangar addition.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



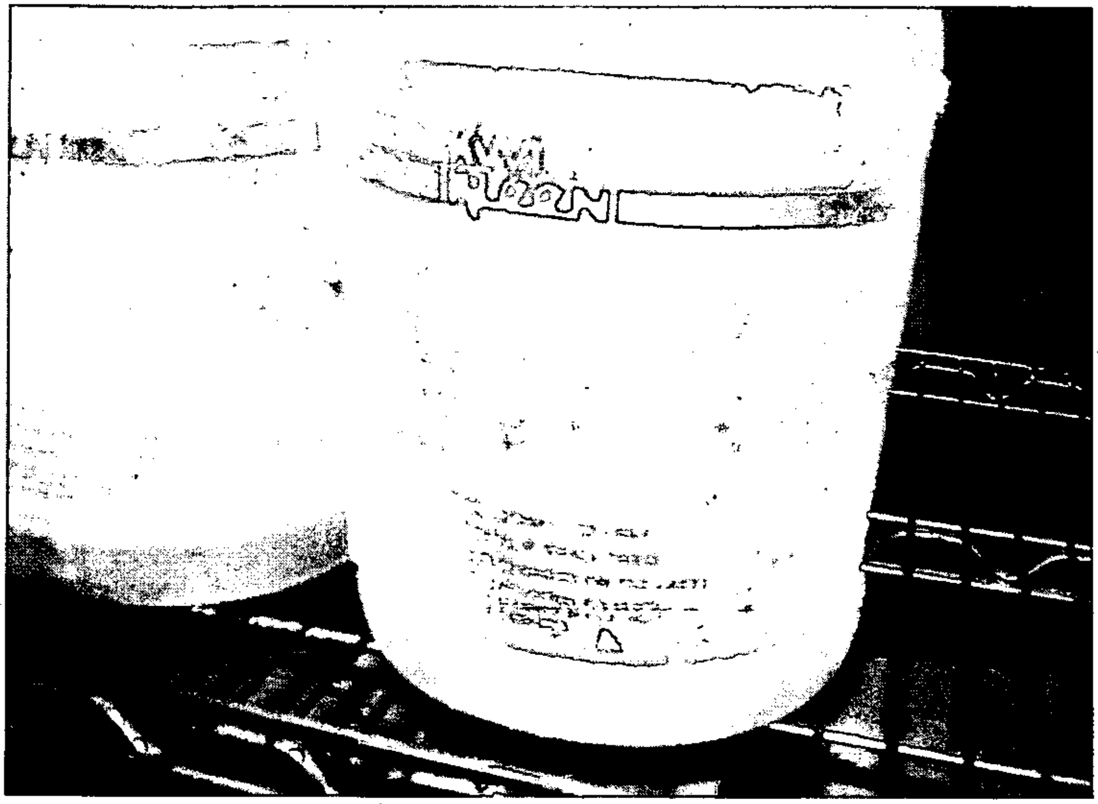
Date: May 16, 2014
Time: 12:32 PM
Direction: E-NE
Photo by: Eisenbrandt
Exposure #: 021
Comments: Another view of the floor trough and catch basin/sump on the east side (the older half of the combined hangar).

Ambient hangar PID reading Mid 80's ppm

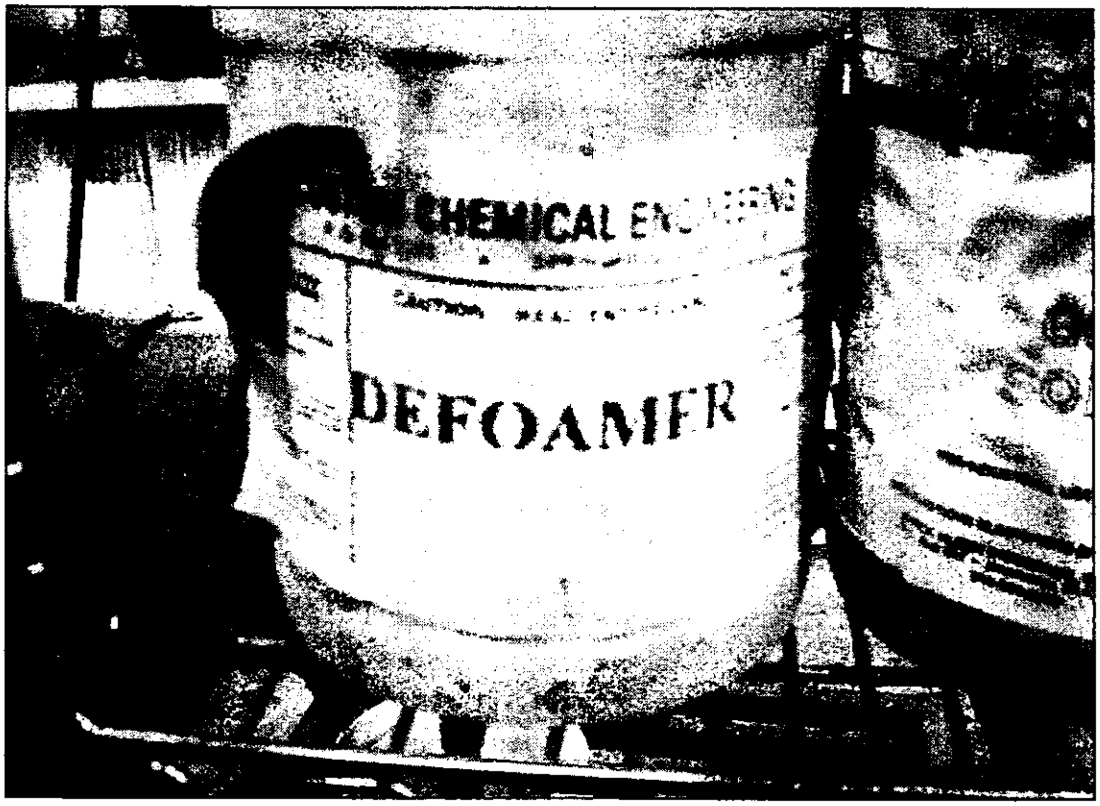
Date: May 16, 2014
Time: 12:32 PM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 022
Comments: Chemicals used in the Kwick Kleen Solvent Stripper treatment process.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



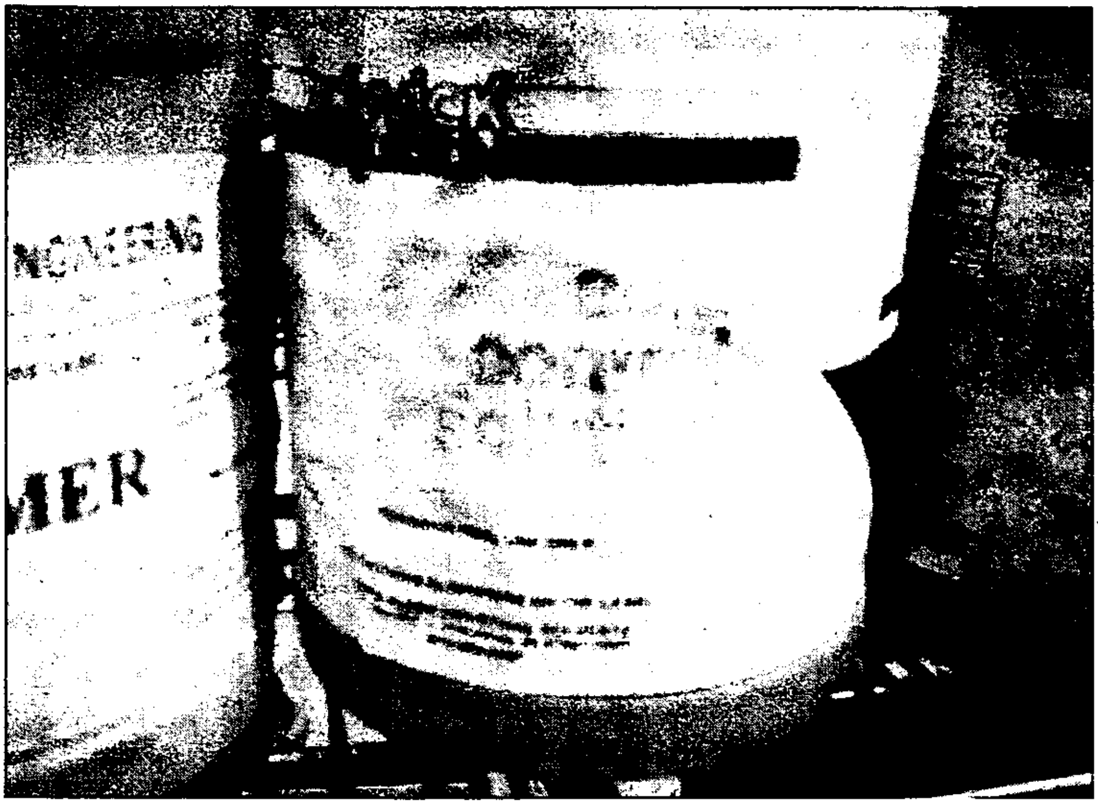
Date: May 16, 2014
Time: 12:32 PM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 023
Comments: Labeling faded and illegible on 1-gallon container (right). The left container read "Base Control Solution".



Date: May 16, 2014
Time: 12:33 PM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 024
Comments: One-gallon container of "Defoamer".

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS

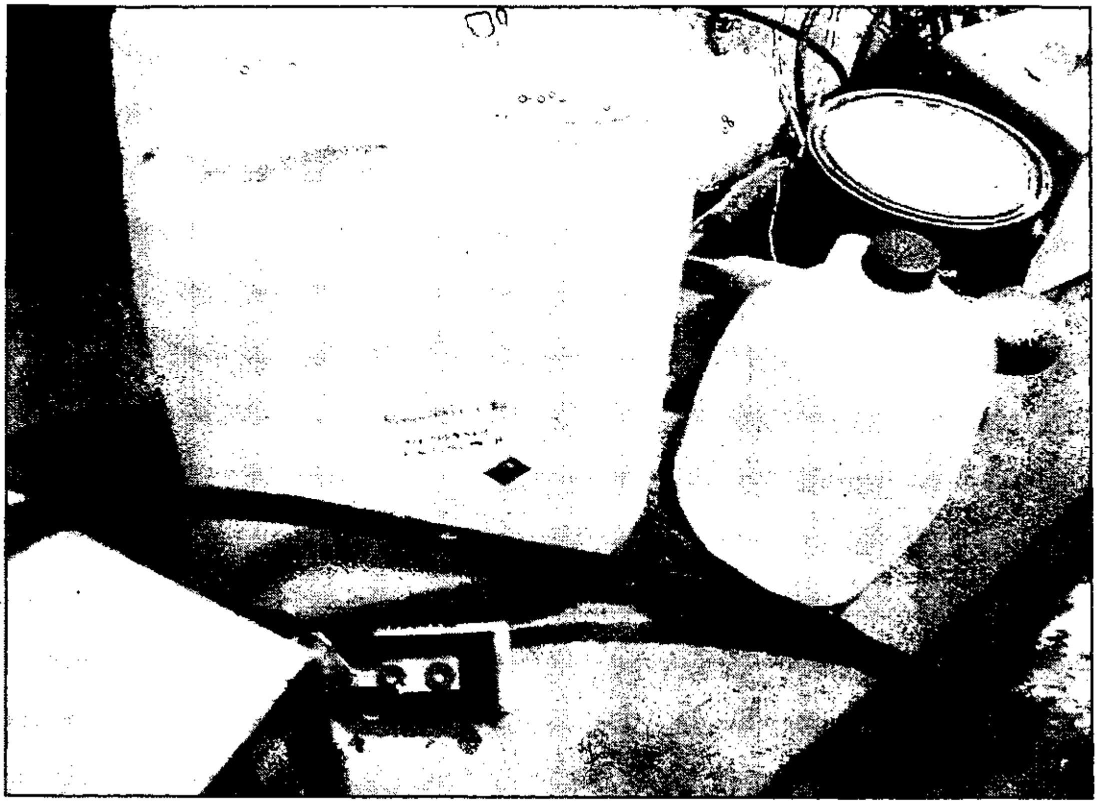


Date: May 16, 2014
Time: 12:33 PM
Direction: S
Photo by: Eisenbrandt
Exposure #: 025
Comments: One-gallon container of "Acid Control Solution".

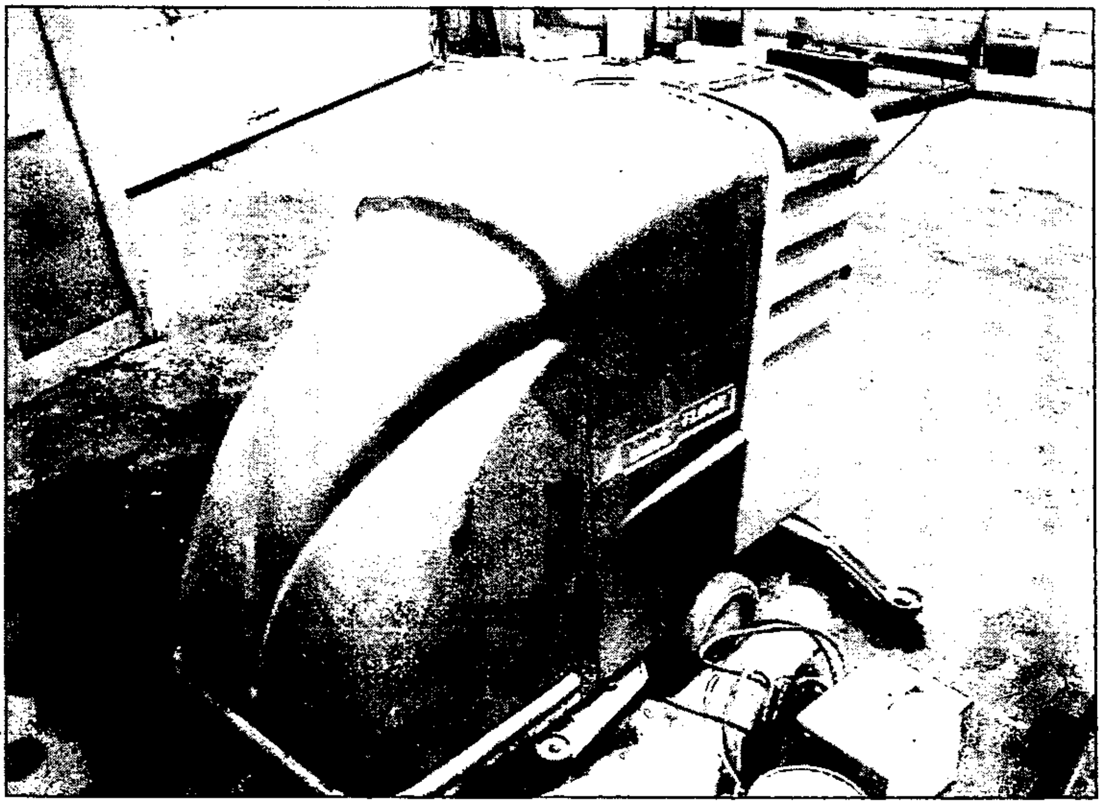
Date: May 16, 2014
Time: 12:34 PM
Direction: N
Photo by: Eisenbrandt
Exposure #: 026
Comments: A Kwick Kleen box with "Corrosive" placard. The box was labeled "Base Control" and "Sodium Hydroxide" in red handwriting.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



Date: May 16, 2014
Time: 12:34 PM
Direction: SW
Photo by: Eisenbrandt
Exposure #: 027
Comments: A methanol 5-gallon container hold about one (1) gallon of chemical.

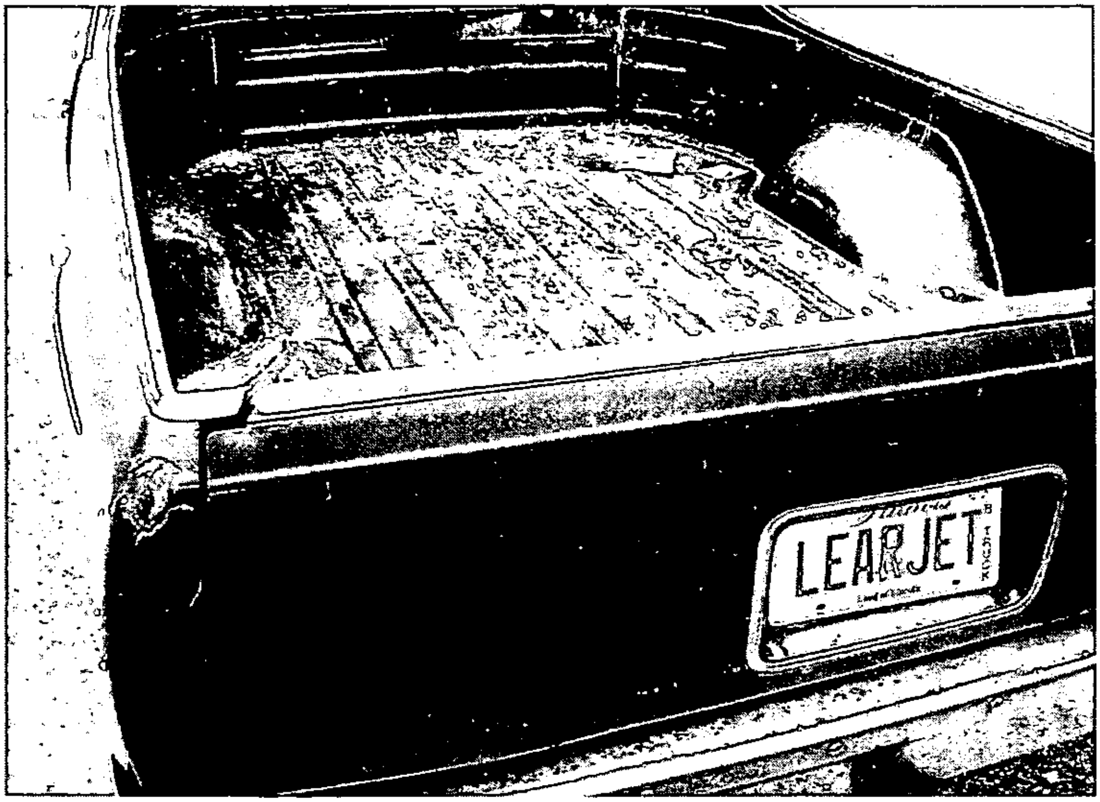


Date: May 16, 2014
Time: 12:34 PM
Direction: SW
Photo by: Eisenbrandt
Exposure #: 028
Comments: A Rabbit Floor cleaner.

Photograph File: 0210600007~05162014-[Exp. #].jpg

R000184

DIGITAL PHOTOGRAPHS



Date: May 16, 2014
Time: 12:51 PM
Direction: S-SW
Photo by: Eisenbrandt
Exposure #: 029
Comments: Bed of blue Chevy El Camino seen in Photograph 001.

Date: May 16, 2014
Time: 12:51 PM
Direction: SE
Photo by: Eisenbrandt
Exposure #: 030
Comments: Eleven empty 55-gallon poly drums, two 55-gallon steel drums (partially full), and an empty 30-gallon steel drum stored on the northwest corner of the building.

PID readings from drum headspaces, and field pH of residue are noted.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS

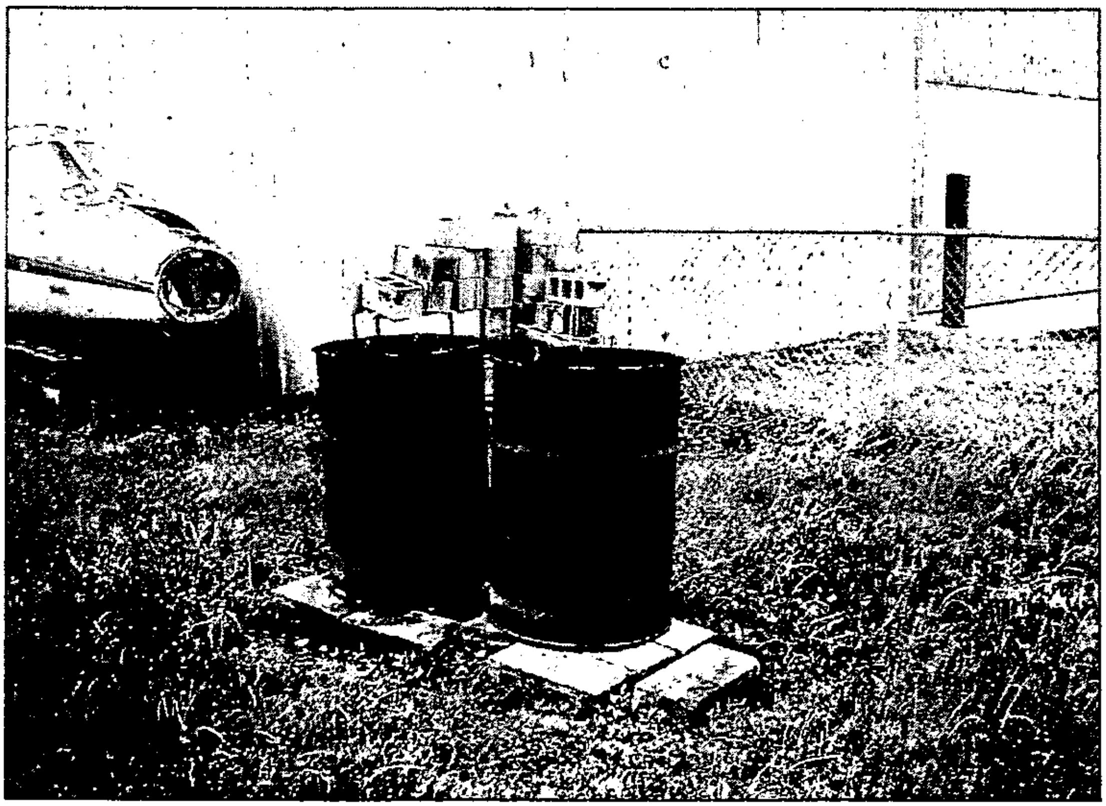
Date: May 16, 2014
Time: 12:52 PM
Direction: E
Photo by: Eisenbrandt
Exposure #: 031
Comments: Another empty 55-gallon poly drum.

Date: May 16, 2014
Time: 12:55 PM
Direction: S
Photo by: Eisenbrandt
Exposure #: 032
Comments: Close up image of labeling on black 55-gallon steel drum seen on the back right side in Photograph 030.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS

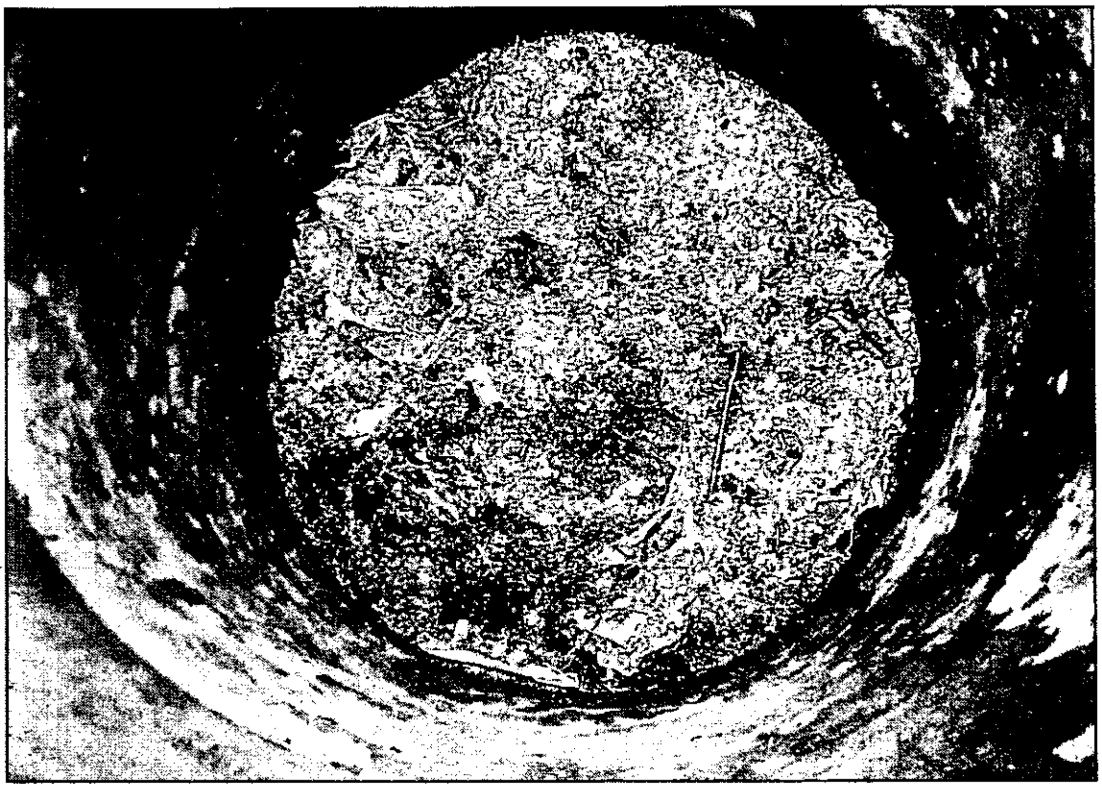
Date: May 16, 2014
Time: 12:55 PM
Direction: S
Photo by: Eisenbrandt
Exposure #: 033
Comments: Close up image of labeling on black 55-gallon steel drum seen on the back left side in Photograph 030.



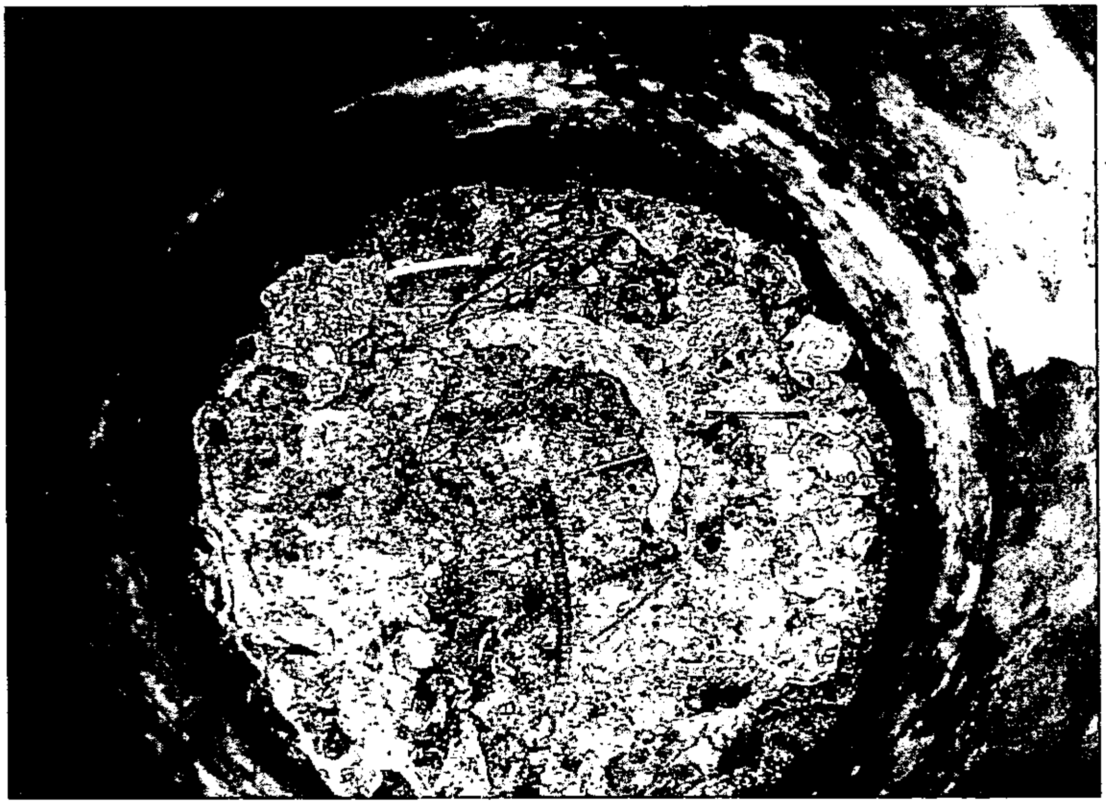
Date: May 16, 2014
Time: 12:56 PM
Direction: NE
Photo by: Eisenbrandt
Exposure #: 034
Comments: Two rusty steel burn barrels.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



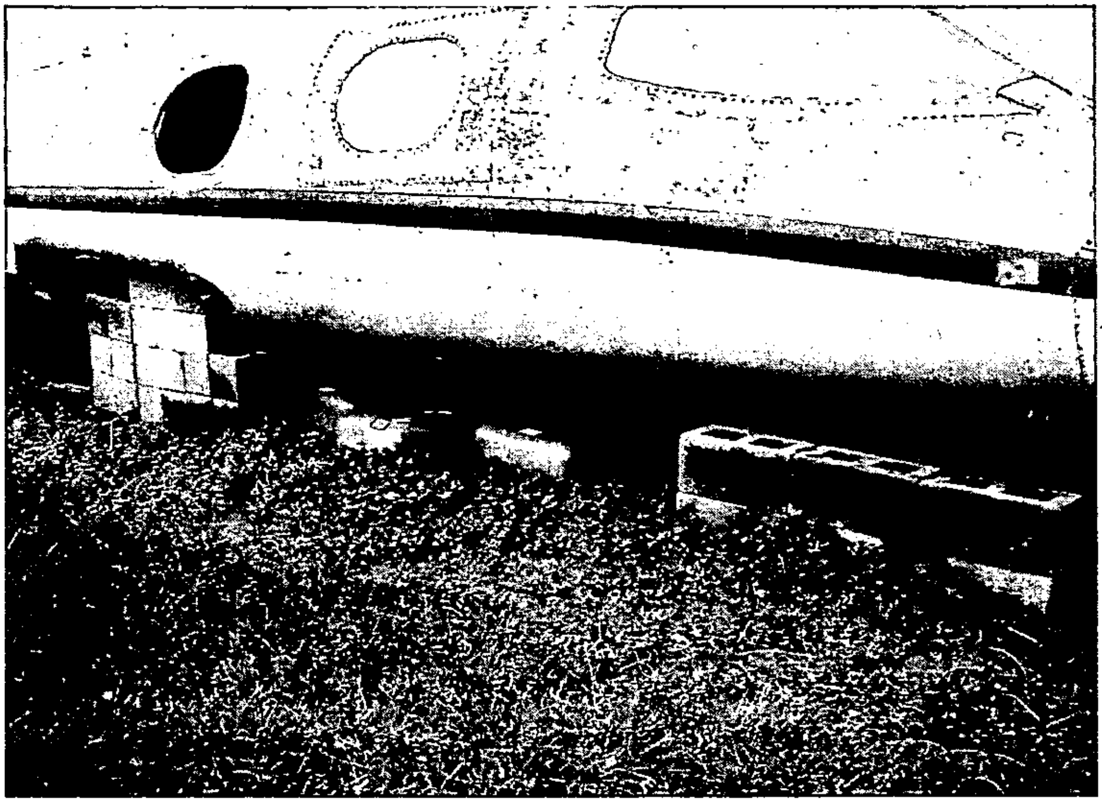
Date: May 16, 2014
Time: 12:56 PM
Direction: E
Photo by: Eisenbrandt
Exposure #: 035
Comments: View inside right burn barrel seen in Photograph 034.



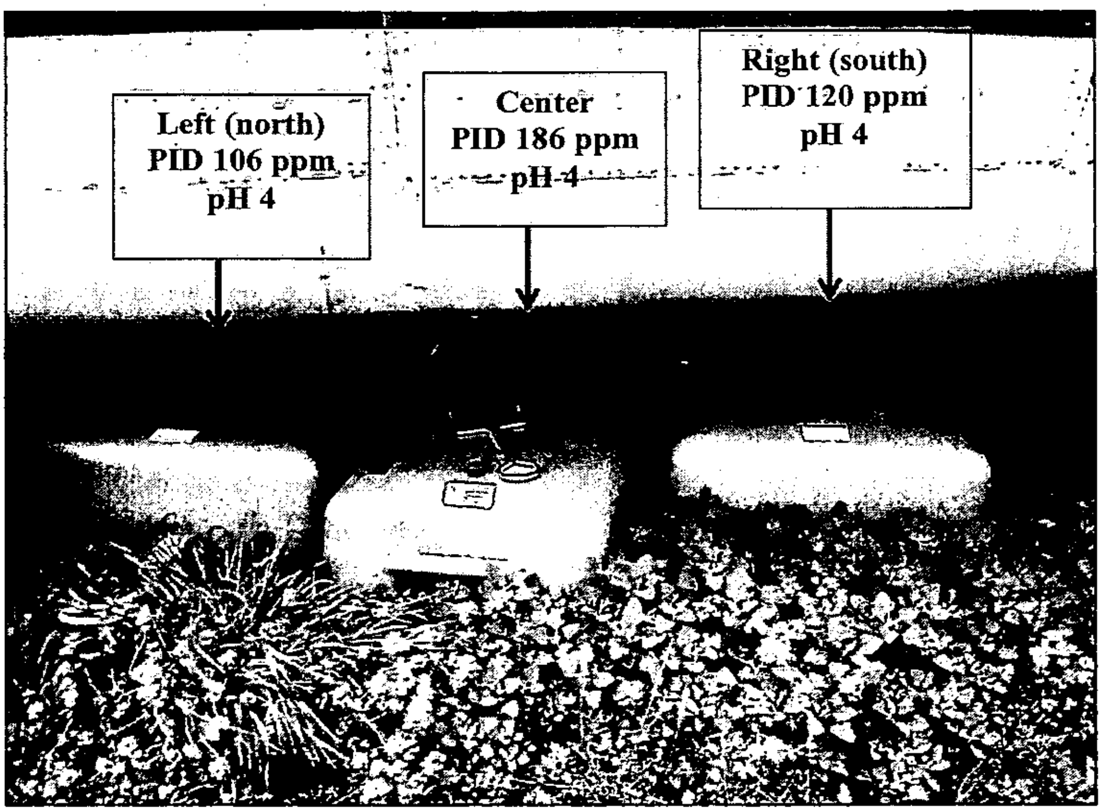
Date: May 16, 2014
Time: 12:56 PM
Direction: E
Photo by: Eisenbrandt
Exposure #: 036
Comments: View inside left burn barrel seen in Photograph 034.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



Date: May 16, 2014
Time: 12:56 PM
Direction: NE
Photo by: Eisenbrandt
Exposure #: 037
Comments: Three blue plastic carboys under airplane fuselage.



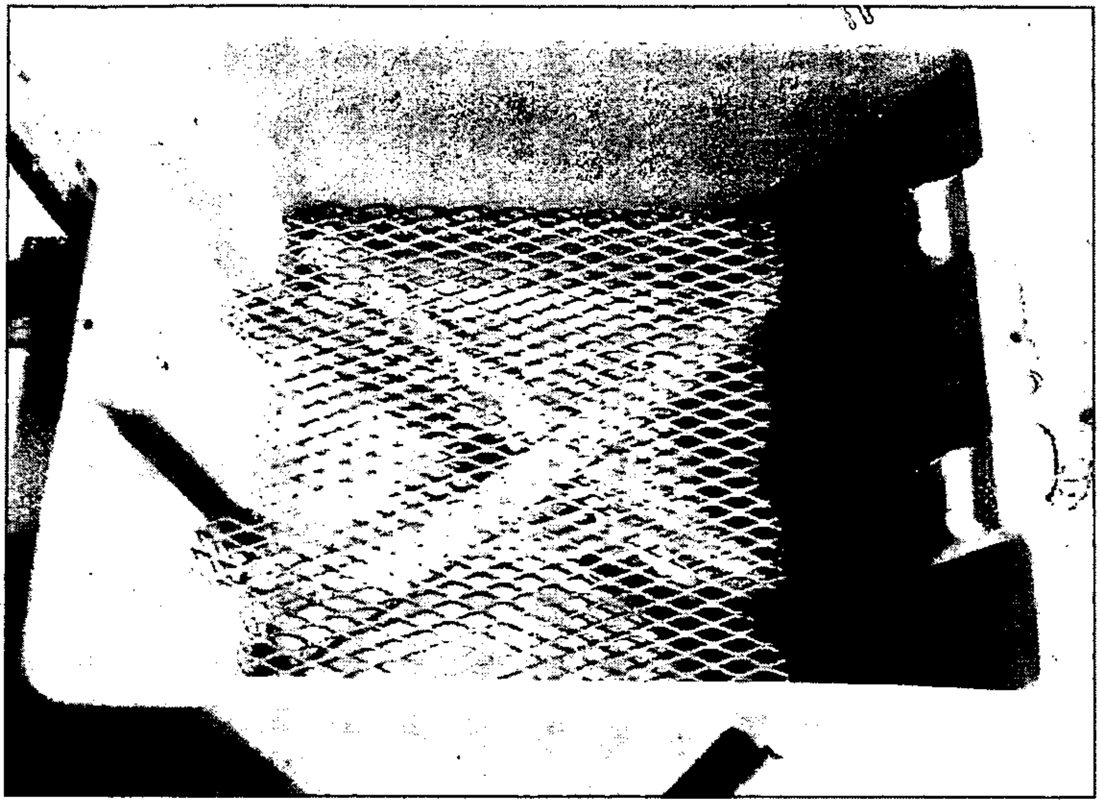
Date: May 16, 2014
Time: 12:56 PM
Direction: E
Photo by: Eisenbrandt
Exposure #: 038
Comments: Close up image of three blue plastic carboys (also seen in Photograph 037).

Two carboys appeared to have about a 30 gallon capacity while the middle carboy was slightly less.

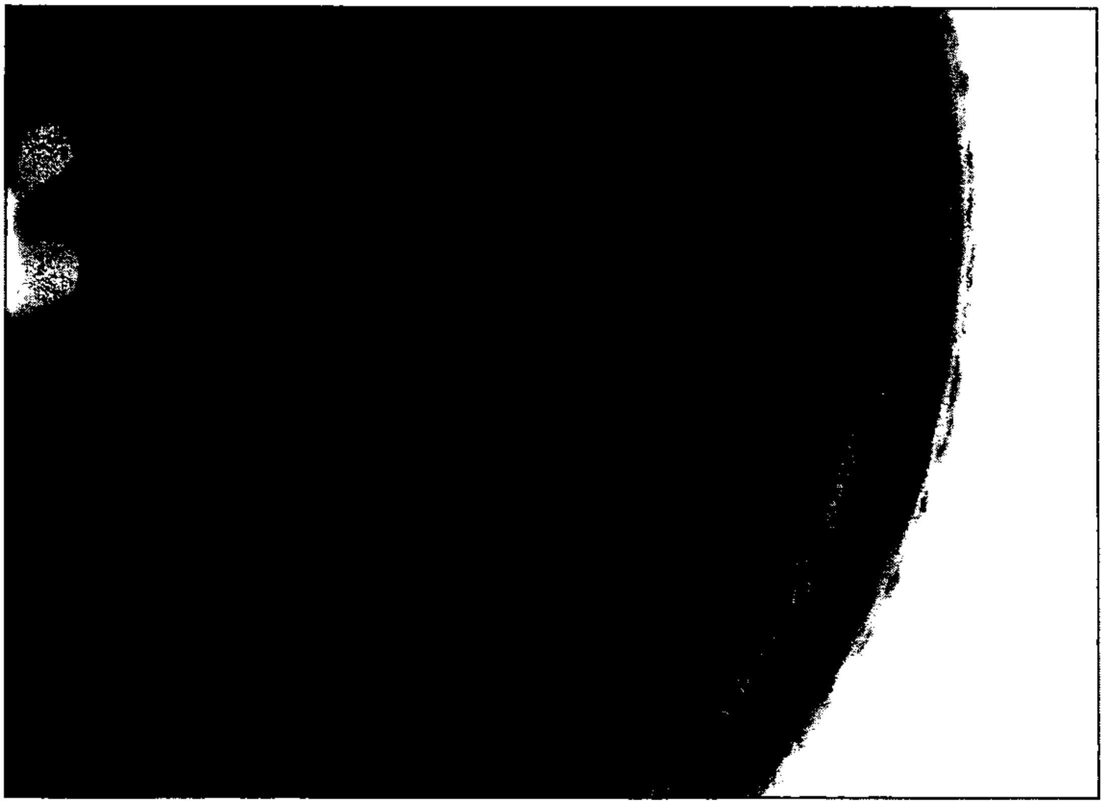
PID headspace readings and pH of residues are noted.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



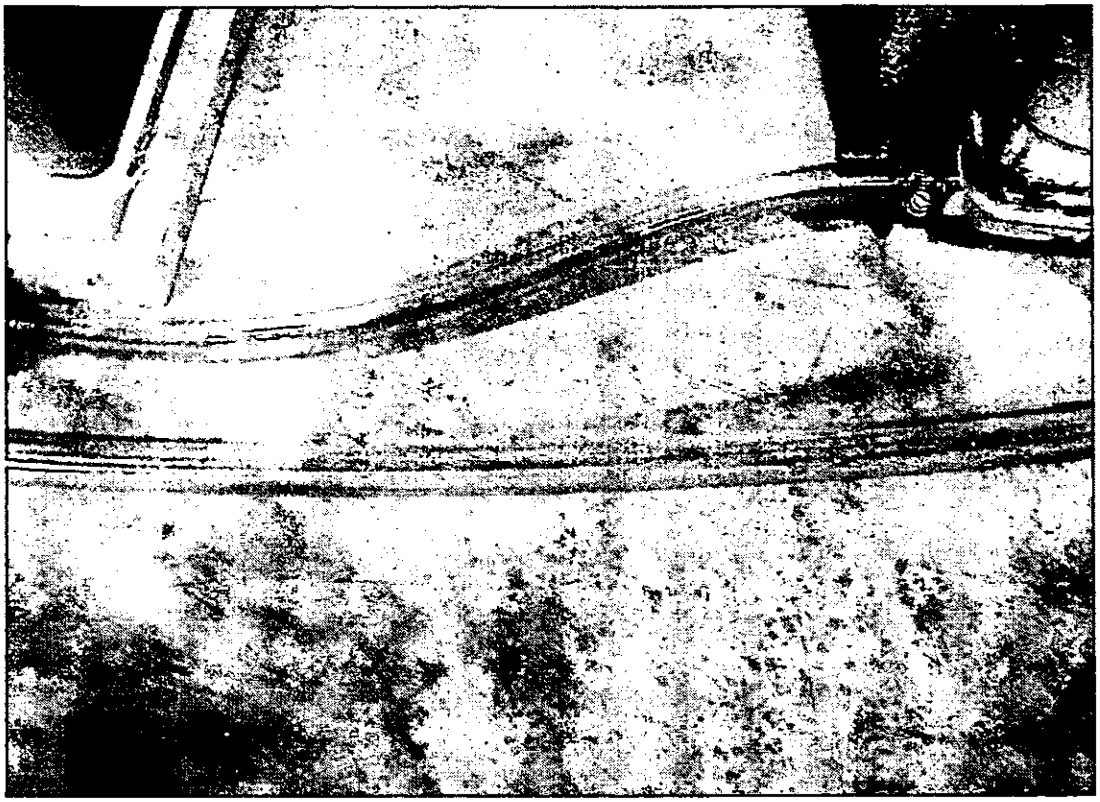
Date: May 16, 2014
Time: 12:59 PM
Direction: W
Photo by: Eisenbrandt
Exposure #: 039
Comments: Gray plastic bin from the Kwick Kleen Solvent Stripper treatment center.



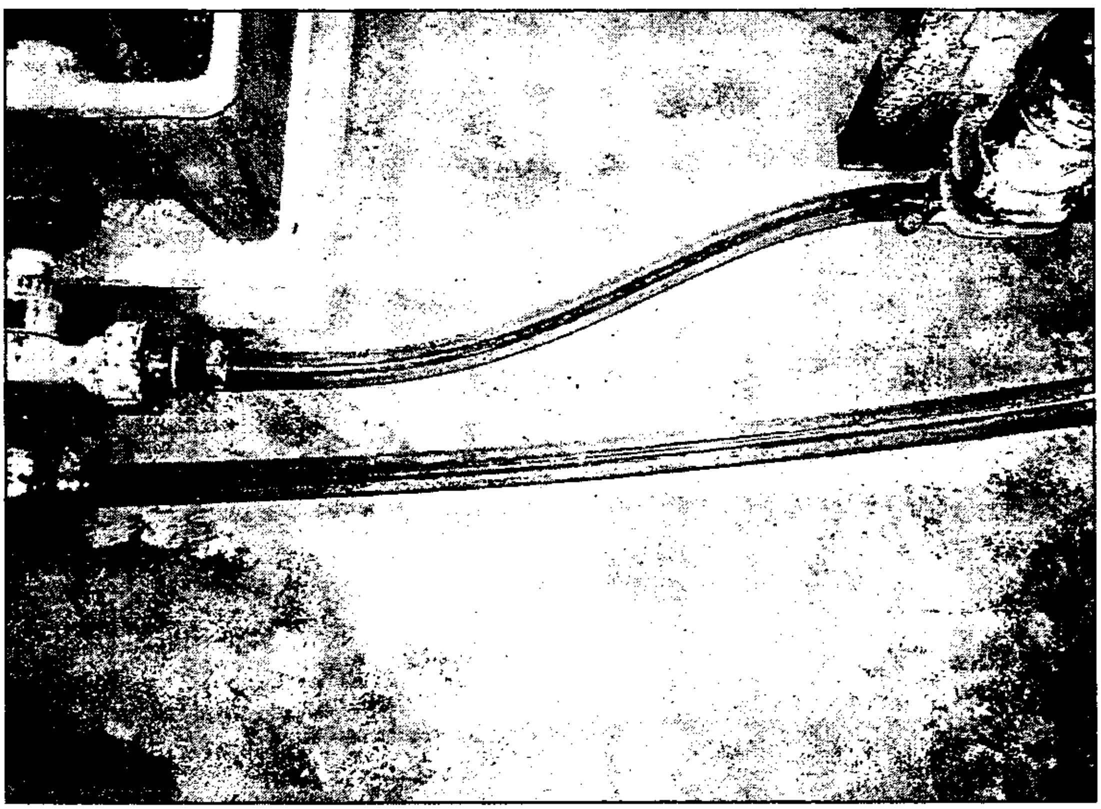
Date: May 16, 2014
Time: 12:59 PM
Direction: W
Photo by: Eisenbrandt
Exposure #: 040
Comments: View inside the elevated hopper from the Kwick Kleen Solvent Stripper treatment center.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



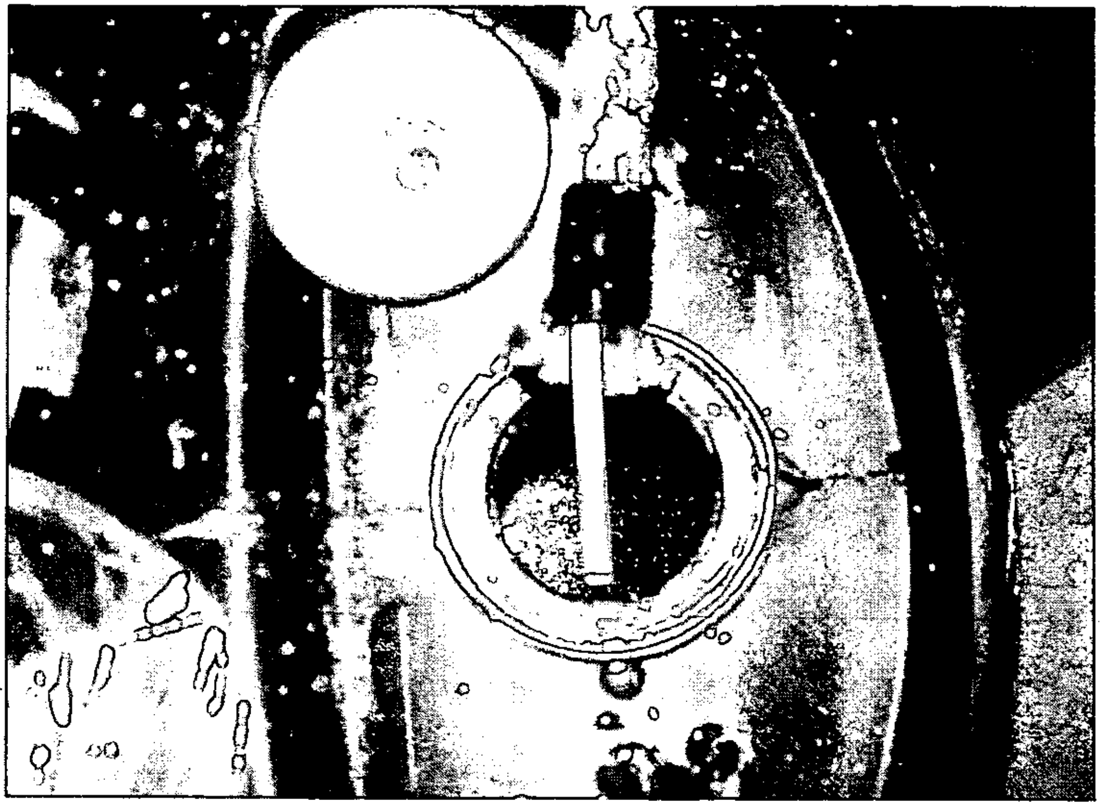
Date: May 16, 2014
Time: 1:00 PM
Direction: S
Photo by: Eisenbrandt
Exposure #: 041
Comments: Transfer tubing running from the gray plastic bin to the 55-gallon poly drum of the Kwick Kleen Solvent Stripper treatment center.



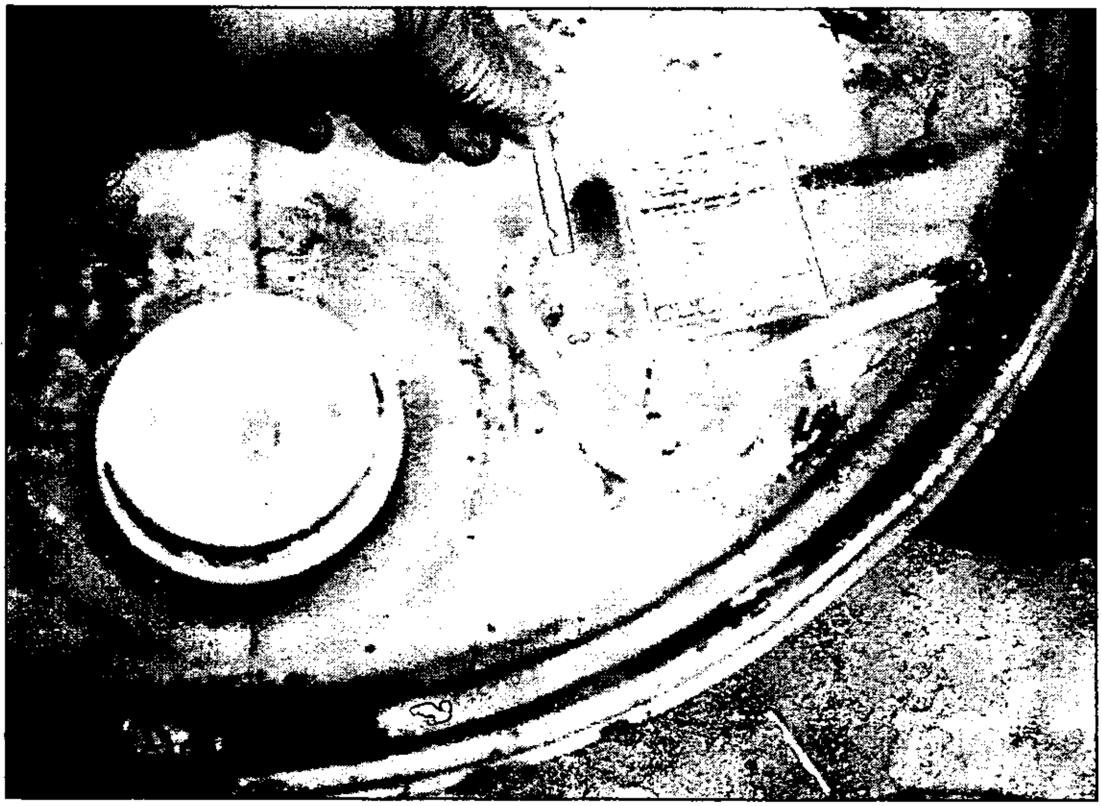
Date: May 16, 2014
Time: 1:00 PM
Direction: S
Photo by: Eisenbrandt
Exposure #: 042
Comments: Alternate image of the transfer tubing running from the gray plastic bin to the 55-gallon poly drum of the Kwick Kleen Solvent Stripper treatment center.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



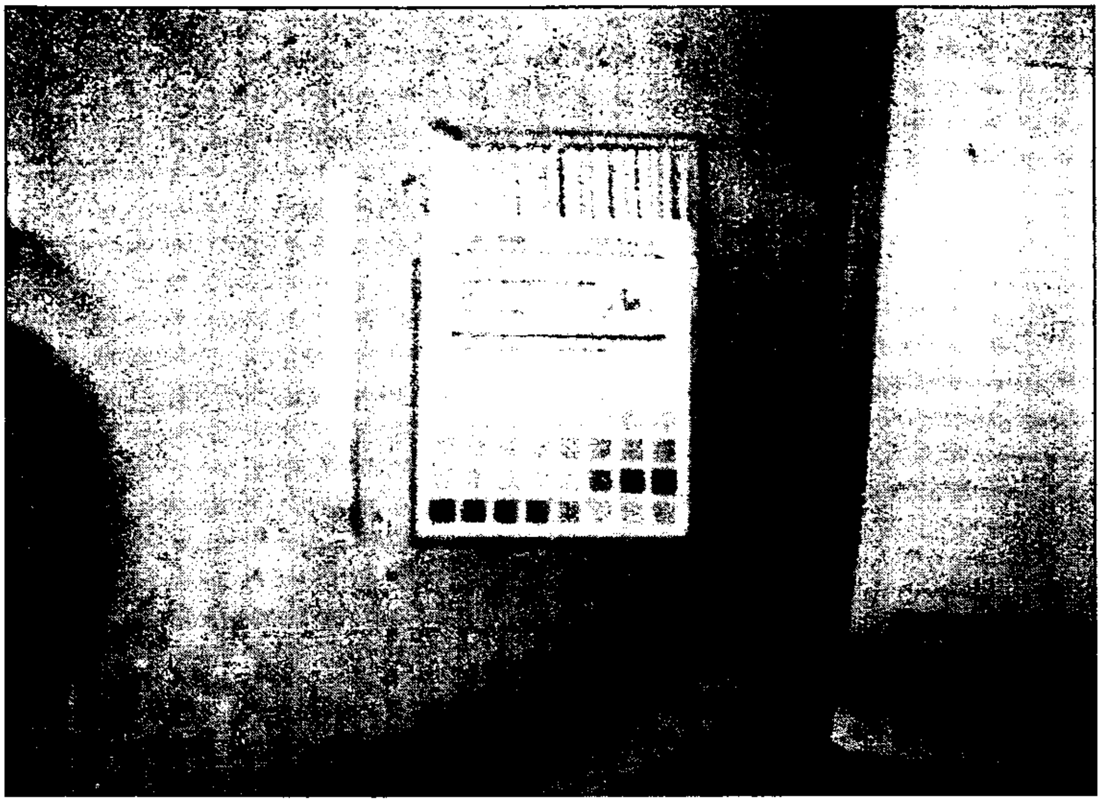
Date: May 16, 2014
Time: 2:34 PM
Direction: W
Photo by: Eisenbrandt
Exposure #: 043
Comments: pH test strip from a 55-gallon drum of Kwick Kleen #945 Paint Remover. The test strip indicates the pH was approximately 1.



Date: May 16, 2014
Time: 2:37 PM
Direction: S
Photo by: Eisenbrandt
Exposure #: 044
Comments: The drum initially thought to contain Kwick Kleen #945 Paint Remover (see Photograph 002) actually contained rinse water with a pH between 3 & 4.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS

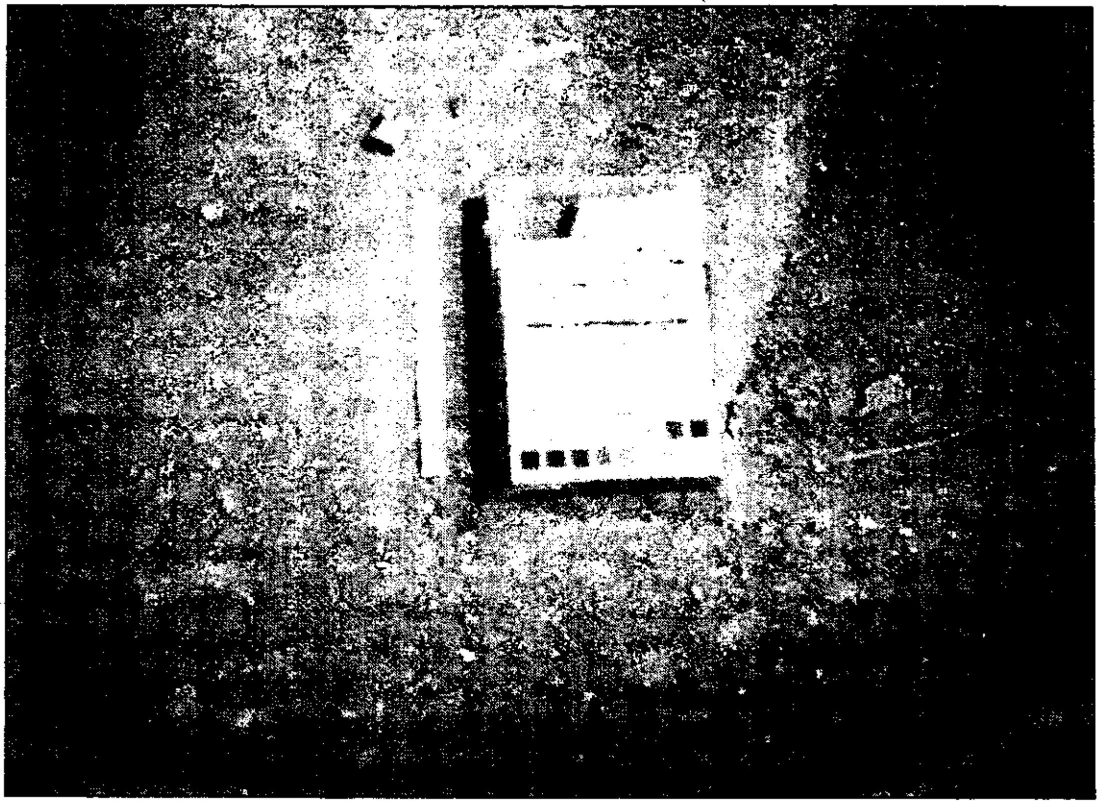


Date: May 16, 2014
Time: 2:37 PM
Direction: S
Photo by: Eisenbrandt
Exposure #: 045
Comments: Rinse water pH 3-4.

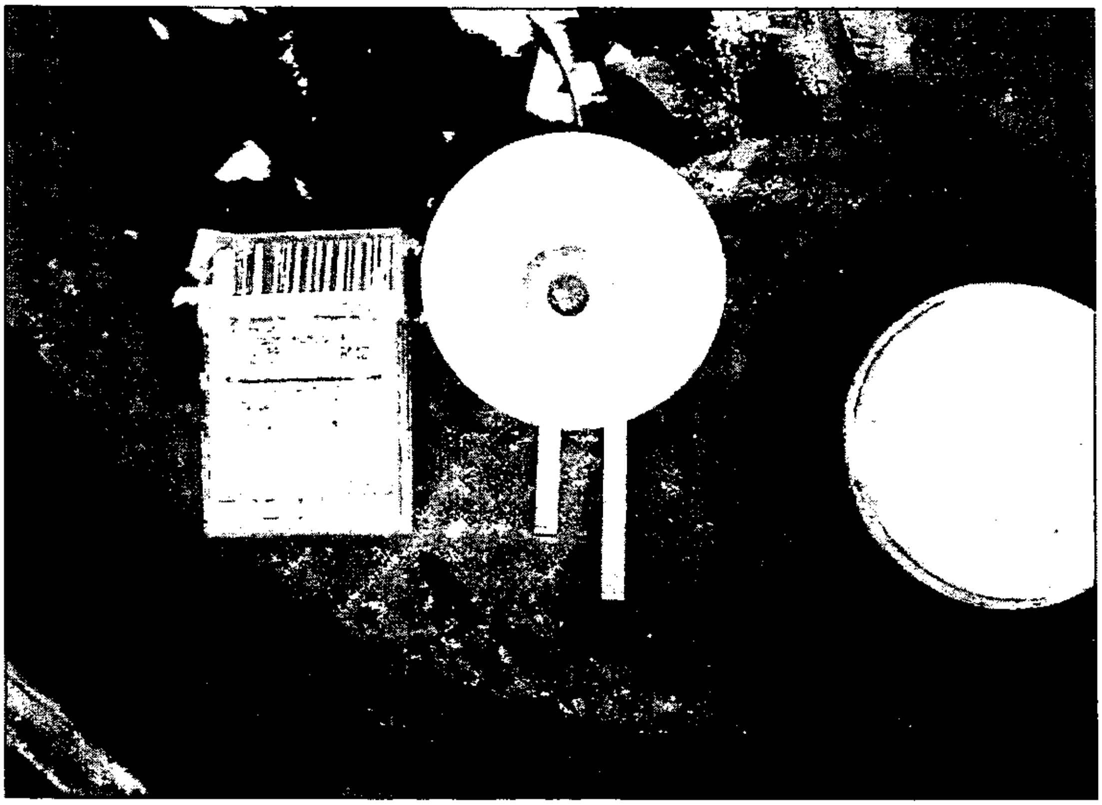
Date: May 16, 2014
Time: 2:39 PM
Direction: S
Photo by: Eisenbrandt
Exposure #: 046
Comments: Rinse water pH between 3 & 4.

Photograph File: 0210600007-05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



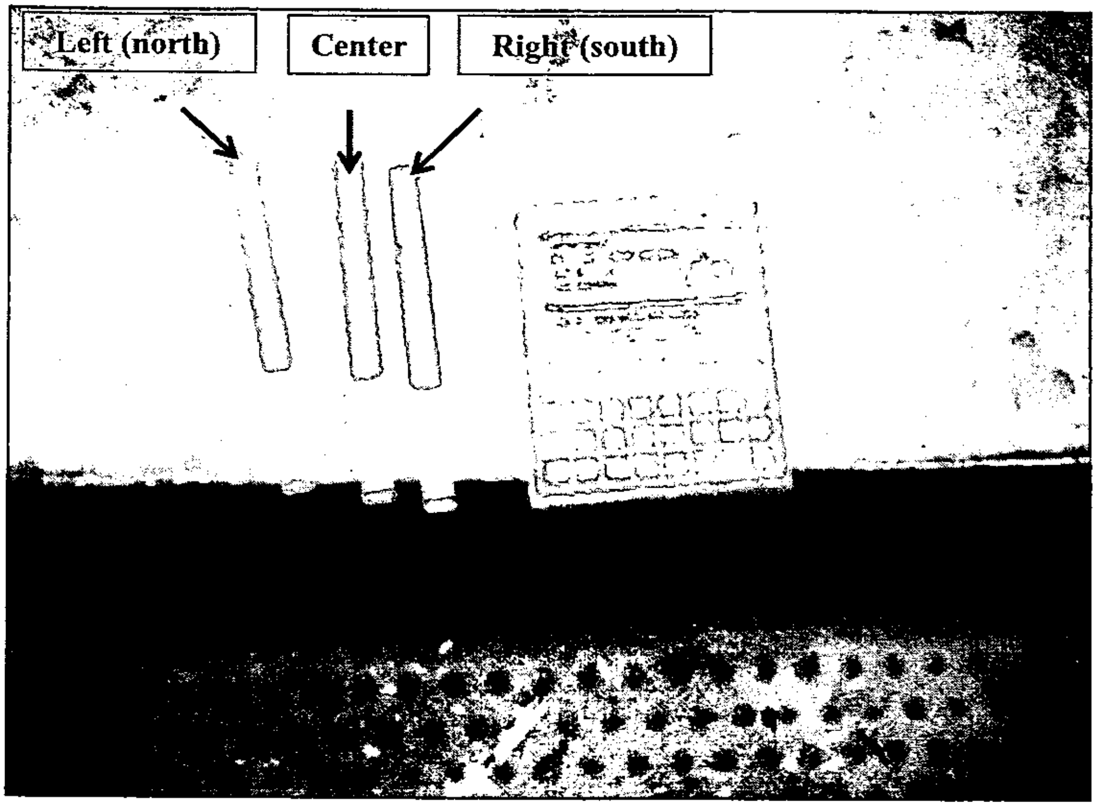
Date: May 16, 2014
Time: 2:40 PM
Direction: S
Photo by: Eisenbrandt
Exposure #: 047
Comments: Rinse water pH at 4.



Date: May 16, 2014
Time: 2:46 PM
Direction: S
Photo by: Eisenbrandt
Exposure #: 048
Comments: Rinse water pH 3 & 4 from drums outside of building.

Photograph File: 0210600007~05162014-[Exp. #].jpg

DIGITAL PHOTOGRAPHS



Date: May 16, 2014
Time: 2:53 PM
Direction: W-SW
Photo by: Eisenbrandt
Exposure #: 049
Comments: pH strips from the three blue plastic carboys indicate the pH readings at 4. Note the order is respective to position of the carboys shown in Photographs 037 & 038.

Photograph File: 0210600007-05162014-[Exp. #].jpg

MATERIAL SAFETY DATA SHEET

Section 1- CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name (Same as on label): KWICK KLEEN PAINT REMOVER 945
General use: Paint and and finish remover
Product Description: Halogenated Hydrocarbon, Aromatic blend

MANUFACTURER:
Rostorm, Inc.
1202 Barnett, P.O. Box 807
Vincennes, Indiana 47591

EMERGENCY TELEPHONE NUMBERS:
CHEMTREC (800)-424-9300
Information (812) 882-3987

Section 2 - COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient (CAS No.)	% Wt	Occupational Exposure Limit		Vap Pres.
Methylene Chloride (75-09-2)	67-77	OSHA 8 hr. TWA	25 ppm	350 mm 68°F
		ACGIH 8 hr TLV	50 ppm	
Toluene (108-88-3)	3	OSHA 8 hr. TWA	200 mg/m^3	
		ACGIH	100 mg/m^3	22 mm 68°F
Formic acid (64-18-6)	14	ACGIH TWA	5 ppm	11 mm 68°F
Acetic acid (64-19-5)	6	ACGIH TWA	10 ppm	21 mm 68°F

Threshold limit value for mixture is calculated in accord with appendix C.A.2 of ACGIH Threshold limit Values and Biological indices for 1988-1989

Section 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

4=Extreme
3=High
2=Moderate
1=Slight
0=Very Low

HMIS HAZARD RATING:

Health..........2
Flammability..........1
Reactivity..........1

Cloudy liquid. Irritating odor. Toxic fumes are released in fire situation. Harmful if inhaled. Can cause death if to much is breathed. Clear all personnel from area. Wear full protective equipment. Contain liquid to prevent contamination of soil, surface water or ground water.
May cause severe burns to eyes and skin.

POTENTIAL HEALTH EFFECTS:
Effect of acute overexposure unless noted as chronic:
INHALATION: Irritation of mucous membrane, dizziness, headache, vertigo, drowsiness, blurred vision, nausea. Severe symptoms may be delayed 12 to 18 hrs. Chronic poisoning may cause visual impairment or blindness. Elevated carboxyhemoglobin.
SKIN: Prolonged exposure may cause burning sensation, scaling and eventual defatting of skin. May be absorbed through skin.
INGESTION: Vomiting may result. Shock and acidosis may result. Chronic exposure may cause serious damage to CNS, liver and vision.
EYES: Painful irritation and possible damage to eye.
Medical conditions generally aggravated by exposure: Persons with known allergies, diabetes, heart or respiratory problems should observe extra care.

Chemical listed as carcinogen:

	Yes	No
NTP	X	
IARC monographs	X	
OSHA		X

CHRONIC TOXICITY
Chronic overexposures to methylene chloride have caused liver and kidney disease in experimental animals.
Carcinogenicity: Methylene chloride has been evaluated for possible cancer causing effects in laboratory animals. Inhalation studies at concentrations of 2,000 and 4,000 ppm increased the incidence of malignant liver and lung tumors in mice. Three inhalation studies of rats have shown increased incidence of benign mammary gland tumors in female rats at concentrations of 500 ppm and above and increases in benign mammary gland tumors in males at concentrations of 1,500 ppm and above. Rats exposed to 50 and 200 ppm via inhalation showed no increased incidence of tumors. Mice and rats exposed by ingestion at levels up to
250 mg/kg/day lifetime and hamsters exposed via inhalation to concentrations up to 3,500 ppm lifetime did not show an increased incidence of tumors.
The International Agency for Research on cancer considers liver and lung tumors in mice as limited evidence of animal carcinogenicity. The significance of benign mammary gland tumors is unknown.
Epidemiology studies of 751 humans chronically exposed to methylene chloride in the workplace for a minimum of 20 years did not demonstrate any increase in deaths caused by cancer or cardiac problems. A second study of 2,227 workers confirmed these results.
Methylene chloride has been identified as an an animal carcinogen by NTP. Methylene chloride is listed on the IARC and NTP carcinogen list but not by OSHA.
Reproductive Toxicity: Reproduction toxicity tests have been conducted to evaluate the adverse effects methylene chloride may have on reproduction and offspring of laboratory animals. The results indicate that methylene chloride does not cause birth defects in laboratory animals.

Section 4 - FIRST AID MEASURES

INHALATION: Remove patient to fresh air and assist with respiration if necessary. Obtain medical attention. Careful attention to acidosis and possible ethanol therapy.
SKIN: Remove contaminated clothes and flush with water for 15 min. If irritation persists, get medical attention.
INGESTION: Get medical attention. Do not induce vomiting. If spontaneous vomiting occurs, keep head below hips to avoid aspiration of liquid into lungs. May cause severe burns to mouth, throat and stomach. Physician may use 1-2% sodium bicarbonate lavage.
EYES: Wash with large amounts of water for 15 minutes lifting lids occasionally for complete washing. Get medical attention. May cause tissue destruction leading to permanent eye damage.
NOTE TO PHYSICIAN: Adrenaline should not be given to persons overexposed to methylene chloride.

Section 5 - FIRE FIGHTING MEASURES

FLAMMABILITY CLASSIFICATION: OSHA, Nonflammable
EXTINGUISHING MEDIA: Dry chemical, CO_2, water fog. Do not use water stream.
UNUSUAL FIRE AND EXPLOSION: Concentrated vapors may burn but will not ignite readily. Decomposition products hydrogen chloride and phosgene gas.
FIRE FIGHTING PROCEDURES: Self contained breathing apparatus should be used. Remove container from fire area if it can be done safely. If not, keep container cool with water.
HAZARDOUS COMBUSTION PRODUCTS:
This product decomposes when put in contact with excessive heat, flame or sparks to form hydrogen chloride gas, carbon monoxide and phosgene gas. When hydrogen chloride gas comes in contact with water or water vapor it may form hydrochloric acid which is corrosive to metals.

Section 6 - ACCIDENTAL RELEASE MEASURES

Remove all sources of ignition and provide ventilation. Small spills may be soaked up with absorbent material and place in a nonleaking container. Evacuate and ventilate the area. For large spills the area should be evacuated. Wear the appropriate respiration equipment. Stop source of leak if possible. Dike and contain. Knock down vapor cloud with water fog. Clean up with vacuum truck. Flush area with water. Recovered material should be sent to licensed reclaimer or incinerated.

Section 7 - HANDLING AND STORAGE

Store at room temperature.
Avoid contact with skin and eyes.
Avoid breathing vapors.
Wash with soap and water before eating, drinking or smoking.
Launder contaminated clothes before reuse.

OTHER PRECAUTIONS:

Keep out of reach of children. Do not transfer contents to bottles or other unlabeled containers for storage. All warranties void if repackaged. Close container after each use. Store in cool, dry place. Do not store in direct sunlight. Keep container cool. Open container slowly to allow venting. DO NOT USE NEAR HEAT, FLAME OR SPARKS. VAPORS MAY IGNITE OR EXPLODE. Fumes are heavier than air and will collect near the floor. Air movement can cause fumes to travel among rooms and fall to lower levels. Use in area equipped according to local building codes and/or as outlined in the Kwick Kleen Operations Manual.

For on site use: TURN OFF all gas appliances, stoves, water heaters, furnaces, and pilot lights. VENTILATE area until all odor of fumes are gone before turning on electric and gas service. DO NOT smoke while in use. Vapors may produce toxic gas when in contact with hot surfaces. Destroy rags, newspapers or drop cloths after use to prevent spontaneous combustion.

Section 8 - EXPOSURE CONTROL/PERSONAL PROTECTION

ENVIRONMENTAL CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Use mechanical ventilation which will move 2 cubic feet per minute of air for every square foot of floor space in the work area. Use explosion proof ventilation equipment.

PERSONAL PROTECTION:

INHALATION:	None if used in ventilation that keeps vapor concentration less than 25 ppm(TWA). Use is not recommended in lesser ventilation.
SKIN:	Rubber gloves,glove liner made of EVOH / polyethylene (silver liner) apron and boots should be worn. Wash with soap and water after use.
INGESTION:	Do not eat, drink, or smoke in the work area. Wash thoroughly before eating, or drinking.
EYES:	Safety goggles should be worn. Contact lenses should not be worn. Eye wash should be available.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Boiling range of solvents: 103-230°F

Vapor Density:	X	Heavier than air		Lighter than air
Evaporation rate:		Faster than ether	X	Slower than ether

% Volatile by weight:	94.5%
Weight per gallon:	9.89
Flash point (PMCC):	none at boiling point
Appearance and odor:	Light yellow and aromatic, sweet
Specific Gravity:	1.19 at 72°F

Section 10 - STABILITY AND REACTIVITY

STABILITY: X Stable ____ Unstable

HAZARDOUS POLYMERIZATION: NO
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon Monoxide, Hydrogen Chloride, Formic Acid
CONDITIONS TO AVOID: Strong oxidizing materials, heat, sparks, open flame.

Section 11 - TOXICOLOGICAL INFORMATION

SKIN:	The dermal LD50 for methylene chloride has not been determined.
	The dermal LD50 for methanol in rats is 15.8 g/kg.
INGESTION:	The oral LD50 for methylene chloride in rats is in the range of 1500 - 2500 mg/kg.

MUTAGENICITY: Negative or equivocal results have been obtained in mutagenicity test with methylene chloride using mammalian cells or animals. This is consistent with the lack of interaction with DNA in rats and hamsters. Although results of Ames bacterial test have generally been positive, overall the data suggest that genotoxic potential does not appear to be a significant factor in the toxicity of methylene chloride.

Section 12 - ECOLOGICAL INFORMATION

DEGRADATION AND TRANSFORMATION:
Material has shown potential to biograde. Attains aerobic degradation rate of 2.3 mg/l/g of activated sludge. Attains aerobic biodegradation in a variety of surface soils. Attains 86 - 92% conversion to CO_2 in anaerobic wastewater. Biodegradation rate may increase in soil and/or water with acclimation. Degradation is expected in the atmospheric environment within months to years.
ECOTOXITY:
Material is slightly toxic to aquatic organisms on an acute basis (LC50 between 10 and 100 mg/L in most sensitive species).

Section 13 - DISPOSAL CONSIDERATIONS

Do not dump into sewers, on the ground, or into any body of water. All disposal methods must be in compliance with all Federal, State and local laws and regulations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Preferred option is to have a licensed hazardous waste contractor to handle the waste.

Section 14 - TRANSPORT INFORMATION

DOT(Department of Transportation)

PROPER SHIPPING NAME:	Paint Related Material
HAZARD CLASS:	8
IDENTIFICATION NUMBER:	UN 3066

Section 15 - REGULATORY INFORMATION

SARA 313 INFORMATION: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

Methylene Chloride (75-09-2)	67-77%
Formic acid (64-18-6)	14%
Toluene (108-88-3)	5 %

Section 16 - OTHER INFORMATION

Date of most recent update: January 12, 2008

Notice: Bestures, Inc. believes that the information contained on this Material Safety Data Sheet is accurate. The suggested procedures are based on experience and best material at the date of publication. They are not necessarily all-inclusive nor fully adequate in every circumstance. Also, the suggestions should not be confused with nor followed in violation of applicable laws, regulations, rules, or insurance requirements. NO WARRANTY, EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE IS MADE.

Attachment B

Kwick Kleen Water Purification System Information

The following pages include

1. May 28, 2014 email correspondence between David White and Paul Eisenbrandt – 1Page
2. Document titled "Operation of the Kwick Kleen Water Purification Systems" – 1 Page
3. May 27, 2014 email correspondence between David White and Paul Eisenbrandt – 2 Pages
4. Document titled "55 Gallon Water Purification Systems Manual" – 14 Pages
5. Document titled "Operations of Solvent Stripper" – 6 Pages

Eisenbrandt, Paul

From: Eisenbrandt, Paul
Sent: Wednesday, May 28, 2014 7:45 AM
To: 'Lori Spires'
Subject: RE: Additional information

David,

Thank you again for the information.

Paul Eisenbrandt
Field Investigator - Environmental Protection Geologist
BOL Region 5 Groundwater Coordinator
Field Operations Section, Bureau of Land
Springfield Field Office - MC #10

Illinois Environmental Protection Agency
1021 North Grand Avenue East, P. O. Box 19276
Springfield, Illinois 62794-9276

217/557-8761 Office
217/557-8728 Fax
E-Mail: Paul.Eisenbrandt@illinois.gov

From: Lori Spires [mailto:kwickkleen3@cinergymetro.net]
Sent: Wednesday, May 28, 2014 7:07 AM
To: Eisenbrandt, Paul
Subject: Additional information

I found this document and thought it may be helpful.

--
David White
Restorco, Inc.
PO Box 807
1202 Barnett Street
Vincennes IN 47591
888-222-9767

fax 812-882-3866
kwickkleen@cinergymetro.net

OPERATION OF THE KWICK KLEEN WATER PURIFICATION SYSTEMS

The Kwick Kleen Water Purification Systems consist of a conical separator and counter current air stripper. The waste water is collected in a floor sump. A pipe "T" is placed on the end of the drain with one end capped and the other connected directly to the clean water output of the purification system. This prevents any untreated water from entering the sewage system.

The waste water is pumped from the sump into the conical separator. The Ph of the water is tested and corrected to between 7 & 8. The water is then flocculated to separate solids, particulate solids and solubilized heavy metals. Once separated, the water is drained into the filter basket which collects all solids. To guarantee the results of this process the filter memprane will allow only properly treated water to pass through it. The solids are dewatered, dried and disposed of accordingly.

Water from the filter basket is pumped into the holding tank and directly through the counter current air stripper (CCAS). The flow of water is regulated by a valve and observed through a flow gage. Water flow is normally between 2 to 4 gallons per minute. The water is sprayed into the top of the CCAS and flows through a plastic medium. Air is blown into the bottom of the CCAS and evaporates the organic solvents, which are exhausted to the atmosphere. The water can then be returned to the holding tank for multiple passes through the CCAS or drained into the sewer. The removal of the organics is determined by the length of time needed to make multiple passes through the CCAS. The time factor is calculated by an analysis of the treated water after the first pass. Under normal conditions, total toxic organics can be reduced to less than 8 to 12 parts per milion (PPM) in one pass and less than 2 PPM after two hours.

Eisenbrandt, Paul

From:	Eisenbrandt, Paul
Sent:	Tuesday, May 27, 2014 1:41 PM
To:	'Lori Spires'
Subject:	RE: Water Purification System Manual

Mr. White,

Thank you for your cooperation.

Paul Eisenbrandt
Field Investigator - Environmental Protection Geologist
BOL Region 5 Groundwater Coordinator
Field Operations Section, Bureau of Land
Springfield Field Office - MC #10

Illinois Environmental Protection Agency
1021 North Grand Avenue East, P. O. Box 19276
Springfield, Illinois 62794-9276

217/557-8761 Office
217/557-8728 Fax
E-Mail: Paul.Eisenbrandt@illinois.gov

From: Lori Spires [mailto:kwickkleen3@cinergymetro.net]
Sent: Tuesday, May 27, 2014 1:01 PM
To: Eisenbrandt, Paul
Subject: Water Purification System Manual

Document attached.

David White
Restorco, Inc.
PO Box 807
1202 Barnett Street
Vincennes IN 47591
888-222-9767
fax 812-882-3866

kwickkleen@cinergymetro.net

Eisenbrandt, Paul

From: Lori Spires <kwickkleen3@cinergymetro.net>
Sent: Tuesday, May 27, 2014 1:01 PM
To: Eisenbrandt, Paul
Subject: Water Purification System Manual
Attachments: Water Purification System Manual.pdf

Document attached.

David White
Restorco, Inc.
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KWICK KLEEN
Restoration Supplies

55 GALLON
WATER PURIFICATION SYSTEM
MANUAL

TABLE OF CONTENTS

INTRODUCTION

Waste is created in different areas in the furniture stripping business. One area of particular concern is water from the rinse area. Many of the best and most popular removers are water rinsable. These provide the fastest and cleanest way to remove finishes from furniture. Of course, this presents the problem of disposing of the rinse water both safely and legally.

Disposing of the rinse water into septic systems should not be done. Once the water goes underground the chemicals do not evaporate from the water. This could lead to contamination of underground water sources.

The Clean Water Act of 1987 prohibits ground run off. You simply cannot legally run your rinse water out into the ground. If you are found to be in violation of this, you could face serious penalties.

At present, most city sewer systems accept the waste water from furniture stripping shops. In general, the percentage of solid residue is so small that it is within the allowable limits. If the water exceeds the allowable limits a waste water purification system may be needed.

Kwick Kleen's Water Purification System meets and exceeds the Federal E.P.A. waste water standards. With our new system the water is scrubbed to remove solids and solubilized heavy metals. The solvents and chemicals are then removed through a process called solvent stripping. Upon completion of the cycle, the purified water can be put into a sewer system or drained into a septic system.

The system is designed to clean approximately 55 gallons of water in a 30 minute cycle. The average stripping shop will generate approximately this amount or more in a day of stripping.

UNPACKING AND PARTS BREAKDOWN

Your system comes on a pallet and the column will be in a crate. Unpack the column and check to see if there is any damage to the column, the 4" 90 degree elbow and the top and bottom caps. Now check the 3/4" tube that runs up the side of the column.

The other parts of the system come on a separate pallet. On this pallet will be the tank, holding drum, drum holder, catch basket, and other items in boxes. This system has colored tape on it. This helps hook it up to the proper place and hook the tubing to the proper hose barb.

PARTS LIST OF THE SYSTEM

A. The Column Parts

1. Column
2. 4" black rubber coupler
3. Drum holder with pump
4. 1" hose barb with blue tape
5. Blower motor assembly
6. Gate valve with yellow tape
7. Strap to mount the column to the wall
8. ¾" 90 degree hose barb with green tape
9. Holding drum
10. Lower drum assemble with violet tape
11. ¾" 90 degree hose barb with yellow tape
12. 1" Tubing about 4" long
13. Control box
14. 1" hose barb with blue tape

B. Tank Parts

1. Tank and electrical control relay
2. Motor assembly with 2 each: nuts, bolts, lockwasher
3. Shaft and propeller
4. Catch basket
5. Catch basket platform
6. Filter membrane
7. Filter screen
8. Filter screen brace
9. 3-way ball valve with red tape
10. Receptacal
11. ¾" tubing 30'
12. 1 ½" tubing about 2'

If you need any help or are short any parts, phone 1-888-222-9767.

ASSEMBLY OF THE SOLVENT STRIPPER

Tools needed to assemble this system.

1. Channel lock pliers
2. 5/16" nut driver
3. Knife
4. Drill
5. Screw driver
6. 1/8" of 5/32" allen wrench
7. 9/16" wrench and ratchet
8. Teflon tap

Parts in the Solvent Stripper.

1. Column
2. Drum holder
3. Control box
4. Holding drum
5. Lower violet drain assembly
6. 4" rubber coupler
7. Motor assembly
8. Gate valve
9. Blower assembly

To assemble the solvent stripper start with the column. There is a white 90 degree elbow on the side of it. Place the 4" black rubber coupler on it about 2", onto the white elbow. Now place the blower assembly on the column and place it into the rubber coupler. Do not tighten the coupler at this time.

Place the blower in line with the white 90 degree elbow. Use the mounting straps to attach the blower to the column. Make sure the straps are in the slots. Once the blower is in alignment with the elbow, tighten all straps. Now tighten the black coupler.

Place the 1" hose barb, with the blue tape, into the center of the column which is also marked with blue tape. Use the channel lock pliers to tighten. Now, place the gate valve with the yellow tape on it into the ¾" pipe with the yellow tape on it. Make sure the valve is pointed up. Then, place the small 90 degree hose barb into the bottom of the ¾" pipe marked with green tape. Make sure all fittings are tightened with teflon tape on the threads.

Now, the column is ready to attach to the wall. Place it where you want it. Place the straps ¾ the distance up the column. Use a 5/16" nut driver to tighten it. Now place the control box on the wall near an outlet. Now attach the cord to the blower.

Now assemble the Holding Tank. This is done using the easy to follow tape marking system. Place the pump that is attached to the orange drum holder facing the front and plug the power cord in so that it can reach the control box. It is best to do this now. Place the drum holder close to the column. Place the drum on the stand with the yellow taped bung facing up.

Now attach the violet taped assembly or drain assembly in the bottom bung of the drum. Tighten until the ball valve is pointing down to the floor. Now, attach the ¾" yellow hose barb to the top bung. Place the 1" 90 degree blue taped hose barb in the top center of drum. Cut the hose that goes from the hose barb marked with blue tape on the column to the one with blue tape on the drum. Try to deep this as straight as possible.

As stated before all connections are color coded. All connections are the same size tubing (3/4") and should be cut to fit. You have received 30 ft. of tubing.

There is green tape on the right side of the pump on the drum stand. This attaches to the bottom of the ¾" tube on the column. This is how the water gets into the column.

Attach a tubing from the yellow tape bypass gate valve to the top of the drum. This will complete the assembly of the solvent stripper. You are now ready to assemble the purification tank.

ASSEMBLY OF THE PURIFICATION TANK

Tools needed to assemble this system:

1. 5/16" nut driver
2. Knife
3. Drill
4. Allen wrench 1/8" or 5/32"
5. 9/16" wrench and ratchet
6. Teflon tape
7. Wall anchor

Parts in the Tank:

1. Motor assembly
2. Shaft and propeller
3. Catch basket
4. 3-way ball valve
5. Filter
6. Filter screen
7. Filter screen brace
8. Tank and electrical control relay
9. Receptacle

To assemble the purification tank, place your tank near the area it will be used. Place the motor mixer shaft onto the motor. This is a 5/8" coupler. You will need to tighten it with a 1/8" allen wrench. Now, place the motor and the shaft in the tank. Attach with the bolts that are supplied. Tighten after you check to see if the shaft is centered. Now, place the motor power cord to the control box on the side of the unit.

Place the wooden platform in front of the mixing tank. Place the catch basket on this platform. Insert the filter screen brace inside the catch basket, forming an (X) pattern. Now place the filter screen into the catch basket. Attach the 3-way ball valve to the catch basket which is marked with orange tape. Connect the hose barb on the 3-way ball valve, which is marked with red tape, to the left side of the solvent stripper pump.

There is also a hose barb on the 3-way ball valve with violet tape on it. This goes to the violet tape on the holding drum.

This will recirculate the water in the system. To make this happen, turn the ball valve in that direction. There will be a 1 ½" hose about 1 ½' long that attaches on the bottom of the purification tank with the clamp.

This tank uses a 240V heating element and needs a 30 amp circuit breaker. You will be provided with a receptacle which the plug from the tank will fit. You will also need a 120V outlet for the control box. Your 240V voltage must be within ten feet of the tank, as will the 120V. You will have to install the control relay to the wall near the 240V source.

After connecting all the electrical devices, your system is ready to use.

If you have any questions or need help, phone 1-888-222-9767.

OPERATION MANUAL
KWICK KLEEN WATER PURIFICATION SYSTEM (55 GALLON)

1. It is recommended that waste water be treated as soon as possible. Transfer waste water from the holding area into the treatment tank. The water level should be 8 to 10 inches from the top of the tank. Attach the air hose to the tank and adjust pressure to 15 psi. This air should cause the water to churn as it would in a vigorous boil. This step is important since it supplies the necessary air for proper flock flotation.

   The water temperature must be at least 20°C (68°F). If the water is too cool the flock will stick to the side of the treatment tank and the filter will clog. Proper water temperature will also help the flock to float properly. Check the temperature with a thermometer and the pH of the water with pH indicator strips. If the temperature is above 20°C, you can treat the water. If the water is too cool, turn the heater switch to the "ON" position and allow the water to reach the proper temperature.

2. Prepare the polymer solution by placing the contents of one packet of the powdered polymer into the clean, dry bottle that has been supplied. *If a dry bottle is not used, clumping will result on the bottom of the jar.* (Note: The polymer solution should not be prepared more than 24 hours prior to use. If the polymer solution becomes older than 24 hours, it should be poured down the drain. The polymer is biodegradable and safe to dispose of in this manner.) Add water, stirring the solution continuously. Close bottle and shake vigorously until polymer is completely dissolved. Solution should look the same throughout. Set the polymer solution aside in a safe place until it is needed later in the process. If this solution is spilled, it should be carefully and completely cleaned up as soon as possible because it is very slick. To clean up polymer solution, use paper towel or cloth.

3. Once the water temperature has reached 20°C, reduce the air pressure to 10 psi and turn the heater switch to the "OFF" position. The air flow should be low, causing a fine flow of bubbles to appear at the surface of the water. The bubbles should not agitate the water but should ruse gently to the surface. If there is any agitation of the water, air pressure is too high.

4. Turn the stirrer switch to the "ON" position and let the water stir for about three minutes.

5. Shake the Kwick Flock container until there are not solids remaining on the bottom of the jug. Pour one gallon of the Kwick Flock liquid into the center of the vortex. Rinse the Kwick Flock jug with small amounts of water until it is clean. Add the rinse water to the treatment tank.

6. If it is necessary to remove hexavalent chromium from your waste water, add the appropriate package of Chrome Cutter at this time. Allow the water to stir for approximately five minutes.

7. Add acid control until the pH comes down to a level of about 3.0 and allow it to stir for one to two minutes. Add base control to the water until the pH raises to 7.0 – 8.0.

8. Pour the polymer solution *slowly* into the water about eight inches form the center of the tank. Continue stirring for about 30 seconds.

9. Turn the stirrer switch to the "OFF" position.

10. Allow the air to run for 30 seconds after the stirrer has been shut off, then shut off the air.

11. Check the quality of the water by removing a beaker full of the water as soon as the air is turned off. A beaker is supplied with the system. If the red flock quickly floats to the surface leaving a clear, golden colored solution, you have good clean water and are ready to proceed to step #12. If there are small specks of material floating in the water or it is not clear, let is stand for fifteen minutes.

Prepare another bottle of polymer solution following the steps outlined in #2.

A dark red color and no separation may be caused by an incorrect pH. If the pH is above 8.5 or below 6.0, adjust with the acid or base control. The acid control is used to lower the pH and the base control is used to raise the pH. Turn the stirrer switch to the "ON" position and add the second bottle of polymer solution. Continue stirring for 30 seconds then turn the stirrer switch to the "OFF" position. Re-check the water quality be removing a water sample with the beaker. If the flock quickly floats to the top leaving a clear golden colored solution, you have good clean water and are ready to proceed to step #12.

If the waste water mixture is still muddy or cloudy after setting for 15 minutes, repeat steps #4 through #12. The only change for the second treatment is that in step #5 use one half the volume of Kwick Flock that you did the first time.

Incorrect temperature may cause the flock to sink. When there is clear water but the flock immediately sinks, locate the valve on the outside surface of the tank just above the cone. Place the hose attached to the valve in the filter basket and turn on valve. The water going into the hose attached to the valve in the filter basket and turn on valve. The water going into the filter basket should be a clear, golden brown color. If you have an air stripper, read its manual as well as the rest of this paragraph for the proper settings of the valves. When the water stops, turn off the valve on the side and turn on the valve at the bottom of the cone. This will allow the remainder of the batch to empty into the filter basket. You are now ready for step #14.

12. Catch the first five gallons of water in a bucket and keep it until all the clear water has passed through the filter cloth. The first five gallons contain small amounts of trapped flock and heavy paint chips with will clog the filter early in the filtration process, making the remainder of the filtration take much longer. Coil the exit tube in the basket and open

the valve. If some flock accidentally gets into the filter early in the process it may save time to stop and wash the cloth then resume the filtration.

13. If you have an air stripper, read its manual as well as the rest of this paragraph for instructions on proper settings of the valves. The system works best if you are able to allow the same amount of water into the basket as runs out of the catch pan. The water level in the pan should be maintained just below the filter cloth. This will reduce the amount of filter clogging when the flock runs out with the clear water.

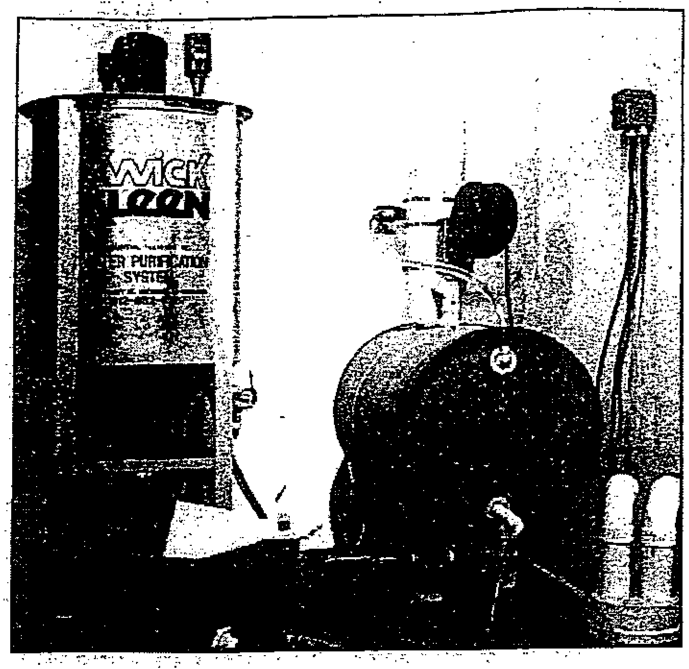
14. Once the flock starts to come out, shut off the valve on the tank. Add the contents of the beaker to the basket and the five gallons that were collected at the start of the filtration. Let the water drain from the basket. Open the valve all the way. When as much flock as possible has run out of the cone, use a hose or power wash to clean the inside of the tank. *Use as little water as possible.*

15. The flock is over 75 percent water when it comes from the tank and much of that water will drain into the catch pan. Let the flock drain over night. The flock that remains should be 2 or 3 inches deep and just moist. Put the flock on a board or some other drying device and allow it to dry. Wash the filter cloth with a hose or power wash and let dry.

If you have any questions contact:

Restorco, Inc.
P. O. Box 807
Vincennes, IN 47591
812-886-0556

***CAUTION: The Base and Acid Control come ready to use. They are both corrosive and must be handled with care. *Always wear eye protection and rubber gloves when working around these chemicals.*



KWICK KLEEN WATER PURIFICATION SYSTEMS

- MANUAL OPERATION
- EXCEEDS STANDARDS
- EASY TO INSTALL
- LEASE - BUY OPTIONS AVAILABLE

55 GALLON ENVIROMATE SYSTEM

The answer to waste water treatment for small water generators. Treats 55 gallons of rinse water for only $2.83 and with the same results as the larger unit. Manual operation requires operator to dispense chemicals and monitor process. Easy installation allows for owner set up. A video tape and assembly manual covers each step of installation and operation of the system. Requires approximately 30 sq. ft. of floor space. Price does not include crating.

Lease - buy options are now available on Kwick Kleen equipment purchases of over $5,000. Ask your Kwick Kleen Representative for more detailed information.

DESCRIPTION	STOCK #	WEIGHT
Enviromate	3160-2550	385.0 lbs.
Aircraft Enviromate	3160A2550	385.0 lbs.

SYSTEM OPTIONS
1. Larger Units
2. Localized Exhaust Systems
3. Rinse Booth Aeration
4. Extra Heat Unit in Water Purification System

WASTE WATER LABORATORY SERVICE

Kwick Kleen will be pleased to assist you with your waste water problems. Our laboratory is specially equipped to analyze waste water. If your community requires periodic testing, we can provide this service for you. Call or write Kwick Kleen for information. See page 43 for more details.

OPERATIONS OF SOLVENT STRIPPER

1. Before you start draining the water into the catch basket. Be sure to place the filter into the basket so that all sides are equal. Now check and make sure that the select valve on the side of the basket is turned to "basket".

2. When you run the first two gallons of water into a bucket check the hose to see if the water clears. If the water is not clear you may half to run more than two gallons into the bucket. When the water clears you can start draining the water into the basket.

3. Turn the tank valve on slowly and drain the water into the basket. When the water starts to float the filter, turn on the blower. Let the blower run for about a minute then turn on the pump. This system is designed so the pump will not come on until the blower is running. This is to protect the fan from water damage.

4. Once the pump is working, the water will go through a control valve on the side of the column. This should be adjusted so only a small amount of water runs back through the bypass hose into the holding tank. If you want to put your water in the holding tank and run it through the column later just open the valve all the way and all the water will bypass into the holding tank.

4. The secret of this operation is to let exactly the same amount of water into the basket that you let out. Always keep the water level just below the filter. This is done so when the clear water run out and the flock starts to run out it will not clogged the filter if there was water in it.

5. Once the flock starts to come out, shut off the valve on the tank. Now would be a good time to add the test beaker and the first two gallons of water into the basket. Let all the water drain from the catch basket. When all the water is out of the basket and you are getting air in the line take the valve on side of the basket and turn it to "tank". This will start the water recirculaating in the system. Once this is done, run all of the flock into the catch basket. Open the valve all the way. When as much flock as possible has run out, use a hose or a power wash to wash down the insides of the tank. Be sure to clean all the flock from the sides of the tank, the sparger, heating element, and stirrer. Use as little water as possable.

6. The flock is over 75% water and will drain into the basket. You will have to switch back to the basket to drain this excess water into the system.

7. Let the flock drain over night. This will leave you with about two inches of flock or less . Then put the flock on a

piece of plywood and let it dry. Take your filter and wash it out with a hose or power wash and let dry.

8. Let your system run for about a hour. Then turn off your pump and let your fan run for about five minutes. You can then turn off the fan.

9. On the bottom of the holding tank there a valve that drains your tank. Turn this to the "on" position. This will empty your drum.

Feb. 12, 1991

OPERATIONS MANUAL FOR THE 55GAL PURIFICATION SYSTEM

It is usually a good idea to treat the water as soon after it is generated as possible.

OPERATION

1. Fill the holding tank with waste water with a pump or with a bucket. The water level should be about 6 inches from the top of the tank for 55 gallons.

A heater is put on the system to be used mainly in the winter. The water temperature needs to be a minimum of 85 F. in the winter. In the winter if your shop is not heated and neither is the water, the flock will tend to stick to the side of the treatment tank. This will clog the filter and slow the filtering process. Heating the water will allow better floating of the flock; thus, alleviating the problem. In the summer or if you have a heated shop, you may not have to use the heater often. You should check the temperature of the waste water. Place the thermometer which is provided in the water.(The temperature of the water should be 85 F or above. In the summer or in a heated shop, you can treat the water.) If not, turn the heater switch to the "ON" position until the water temperature reaches 85 F . If in the summer, the temperature of the water is 75 F of higher, treat as normal. The reason the recommended temperature is higher in the winter than the summer is the side of the tank loses heat rapidly and will cause the flock to sink to the bottom.

After the temperature switch is on hook up the air to the tank. Adjust the air until a pressure of 15 psi is obtained in the line. To do this turn off the valve and adjust the regulator to the proper settling, do this any time you make a air adjustment. This should churn the water similar to a vigorous boil. This step is important, since it is extremely essential in the proper floating of flock later on in the process. Now turn the mixer switch to "ON' position at this time. After the appropriate temperature is reached, the heater switch should be turned to the "OFF" position. Continue to step 2. Pay attention to the time that was required to raise the temperature of the water. This time will not change significantly and can be used as an approximation later.

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SPRINGFIELD REGION
MAY 2 1 2014
Environmental Protection Agency

2. Polymer comes as a white power. You should prepare the amount needed within 2 hours of use, and not more than 24 hours before you intend to use it. If the Polymer solution is older than 24 hours, it should be poured into the sewer. The Polymer is biodegradable and is safe to dispose of in this manner. A 50 gallon batch will require 1 package of the white powder. The dry powder form of Polymer isn't affected by time and will not go bad. <u>Put the entire contents of the packet into a clean dry bottle we have supplied.</u> **(ATTENTION: If a dry bottle is not used, clumping will result on the bottom of the jar.)** Add water, vigorously stirring the solution with the water stream while filling. Add the lid and shake repeatedly. Shake until all the grains have been dissolved and the

solution looks the same throughout. If the solution looks as if it has little lumps, shake more until they disappear. If this chemical is spilled, it should be cleaned up carefully and completely as soon as possible because it is very slick. To clean up the polymer, use paper towels or cloths. The Polymer is cafe to touch, and you should cleaned until the surface is dry. Set the Polymer jar in a place were it won't be broken. It will be needed later in the process.

3. As stated before, after the water has reached the proper temperature of 85 F in the winter or above 75 F in the summer. Turn off the air control valve and reduce the air pressure to 10 psi and then turn it back on also turn the mixer switch to the "OFF" position. The air flow should be gentle, causing a fine flow of bubbles to appear at the top of the water surface. The flow of bubbles should mot be high enough to agitate the water. They should merely rise to the surface gently.

4. Turn the stirrer switch to "ON" position at this time. Let it stir for about 3 minutes before going to the next step.

5. Shake the Kwick Flock container until there are no solids on the bottom of the jug. Pour (1) one gallon of the Kwick Flock liquid into the center vortex of the stirring waste water. Rinse the Kwick Flock jug out with water and add to treatment tank. Let it stir for about 3 minutes. It is recommended that the Kwick Flock be shaken a few hours before treatment starts. This procedure is not essential, but it makes it easier to get complete suspension later.

6. Check the Control Acid and Control Base for adequate volume of solution. Half of a gallon of solution will be adequate.

<u>CAUTION</u>

The Base Control and Acid Control come to you ready to use. They are both corrosive and must be handled with care. <u>Always wear eye protection and rubber gloves when working around these chemicals.</u>

7. Using the hand held pH probe check the pH of the water. Now using the Acid Control pour a small amount into the tank. Let stir for a minute. Check the pH with the meter, bring the pH down to 3 or a little below. The lower you take the pH the more chemical it will take to bring it up. After you reach this level, let it stir for about thirty seconds. Now using the Base Control, slowly bring the pH back up to 7.5 to 8.5 pH. This will take some practice to do this. If you over shoot the upper pH, just add Acid to bring it down.

8. Examine the Polymer that was mixed earlier and be sure that the solution does not have solid particles in it. If it does not, slowly pour it into the waste water in about the

center between the vortex and the side. If there are solid particles in the polymer solution, continue to shake the solution until all particles are dissolved. Pour slowly into the waste water tank as previously instructed and continue to stir for 30 seconds and then go to step 9.

9. Turn the MIXER switch to the "OFF" position.

10. Allow the air to run for 30 seconds after the mixer has been shut off, then shut the air off.

11. Check the quality of the water by removing a beaker full of the waste water as soon as you turn off the air. A beaker will be supplied with the system. If the solid material quickly floats to the top leaving a clear, golden-colored solution, you have done a good job cleaning the waste water. If there are small specks of material floating in the water or it is not clear, let stand for about 15 minutes. If the flock does float to the top of the beaker and the underlying water is clear and a golden-brown color, go to step 12.

If the mixture is a dark red color and the flock will not separate to give a clear golden solution, check the pH. If is above 8.5 turn on the air and the stirrer to the on position and add a little Acid Control to bring it down. If it is too low use a little Base Control. Then add a batch of polymer and after stirring for 30 seconds, then shut off the stir. Let the air run for another 30 seconds then draw another sample with your jar. If the mixture is still muddy or cloudy at the pH of 7.5 to 8.5 and after 15 minutes of setting undisturbed in the beaker, you need to do further work. Go to step 4 and repeat. The only adjustment for the second time around is that in step 5 one half the volume of Kwick Flock should be added again. Repeat steps 4 through 11.
If you get a clear golden brown solution, but the flock sinks to the bottom, your temperature may be incorrect. At this point it is not practical to try to make the flock float. Instead put a hose into the top of tank and siphon the water till the water starts to draw the flock. This hose will be provided. Then empty the remainder of the batch into the catch basket. At this time, proceed with step 3 of the CCAS. (If you have an air stripper, you will all ready be at step 3.)

12. Catch the first 2 gallons of waste water in a bucket and drain the rest in the filter basket after the tank has finished draining. This is done to keep the small amount of flock trapped in the lines and the heavy paint chips from clogging the filter cloth early in the filtration process. Install the filter net into the basket, coil the exit tube in the basket and open the exit valve. If some flock accidently gets into the filter early in the process, either stop and wash the cloth or rub your hands over the cloth to clean the surface.

CLEAN UP OF SYSTEM

The clean up of this system is one of the most important parts to maintain the proper accuracy of this system. This is not hard to do if it is done immediately following the used of the system.

1. The cleanup of the purification tank is done with a powerwash or a garden hose. Hose down the inside of the tank, cleaning the sides. Make sure the sparger, which is the white round device in the bottom, the heater, the heater probe and the stirrer are clean of flock. Use as little water as possible.

2. The pH probe need to be cleaned under tap water, not "HOT". This is one of the most sensitive parts of the system. This must be kept clean. Keeping the thermometer clean by wiping it off after each use.

3. After the flock has had time to drain into the basket, remove the filter and wash out the basket and the holding screen. Run this water into the system. Place the flock on a drying board and wash out the filter with a hose or powerwash. Place the filter in a place where it can dry. This will help to extend the life of it.

4. Fill the basket with clean water and run it into the system. Run the water up the column for about two minute then run the water through the bypass. Run water through the recirculation part of the system. This will clean out all parts of the system. After this is finished, turn on the drain valve at the bottom of the holding drum and drain out the water.

If you maintain your system in this manner, it will last for many years. If you have any questions, phone 1-800-457-9144 or 1-812-882-3987

Illinois EPA FOIA Exemption Reference Sheet

SID: 31539
R000224

Agency ID: 170000368395 Media File Type: LAND
Bureau ID: 0210600007
Site Name: Paint Shop, The
Site Address1: 2207 S Spresser St
Site Address2:
Site City: Taylorville State: IL Zip: 62568-9291

This record has been determined to be partially or wholly exempt from public disclosure

Exemption Type:

Exempt in Whole

Exempt Doc #: 1 **Document Date:** 8 /7 /2014 **Staff:** EAV

Document Description: EMAIL: JANSEN TO MERRIMAN ET AL

Category ID: 01 **Category Description:** FIELD OPERATIONS/INSPECTIONS **Exempt Type:** Exempt in Whole
Permit ID: **Date of Determination:** 10/16/2014

Townsend, Steve

From: Townsend, Steve
Sent: Wednesday, July 23, 2014 1:25 PM
To: Townsend, Steve
Subject: FW: (no subject)
Attachments: usedoil1 001.jpg; usedoil2 001.jpg

LPC # 0210600007 – Christian County
Taylorville/The Paint Shop
USEPA # ILD982621690
FOS FILE

LPC # 0210605081 – Christian County
Taylorville/Evergreen Aviation
FOS FILE

Attachment D

From: TYBRK@aol.com [mailto:TYBRK@aol.com]
Sent: Tuesday, May 27, 2014 9:58 AM
To: Townsend, Steve
Subject: (no subject)

R000226

Safety-Kleen Systems, Inc.

5360 Legacy Drive.
Building 2, Suite 100
Plano, Texas 75024
800-669-5740
217-328-2000

REFERENCE NBR. 55872250
SRVC WEEK: 2011-44
SRVC DATE: 10/25/11 13:49

CUSTOMER# 2370148 BRANDIS AIRCRAFT
2101 S Spresser St
Taylorville IL 62568-9291
PHONE 217-824-8032

PURCHASE ORDER#

TAX EXEMPTION NBR

PRODUCT/SERVICES

SERVICE/ PRODUCT		QTY	UNIT PRICE	TAX	TOTAL CHARGE
66647	USED OIL NO CHARGE (NON P SERVICE TERM 24 WEEK	120.000	0.0000	0.00	0.00
	TOTAL SERVICE/PRODUCTS		0.0000	0.00	0.00

TOTAL CHARGE	0.00
CREDITS	0.00
TOTAL DUE	0.00

UNPAID BALANCE THIS RECEIPT 0.00

Used oil in drums for non-auto generators classified as high risk. Used oil certification form is required for all customers (initial sign-up and when status changes).

GENERATOR STATUS
CESQG: Vehicle

intended to satisfy the requirements of 40 CFR 262.20(e). IN THE EVENT OF AN EMERGENCY CALL 24 HR EMERGENCY # 1-800-468-1760 (Safety-Kleen Contract # 94136) Customer certifies that (i) the above-named materials are properly classified, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and (ii) no material change has occurred either in the characteristics of the waste/material or in the process generating the waste/material. Customer agrees to pay the above charges and to be bound by the terms and conditions (1) set forth in (a) the General Terms and Conditions provided separately to Customer or (b) any SK agreement signed by Customer and SK, and (2) incorporated herein by reference. Unless otherwise indicated in the payment received section, SK is authorized to charge Customer's account for this transaction. Customer certifies that the individual signing this Service Acknowledgement is duly authorized to sign and bind Customer. The following provision is applicable to Safety-Kleen's parts cleaner and paint gun cleaner services: Customer agrees that it will not introduce any substance into the solvent or aqueous cleaning solution, including without limitation any hazardous waste or hazardous waste constituent, except to the extent such introduction is incidental to the normal use of the machine. Customer further agrees that it will not clean parts/paint guns that have been contaminated with or otherwise introduce polychlorinated biphenyls (PCB's), herbicides, pesticides, dioxins or listed hazardous waste into the solvent or aqueous cleaning solution. Safety-Kleen has the capacity and is permitted to accept, store, and/or reclaim the spent parts washer solvent; paint thinners, solvents and paints generated by customer; or dry cleaning filter cartridges, powder, and still residues containing perchloroethylene, petroleum naphtha, or triflurotrichloroethane dry cleaning solvents. Safety-Kleen and customer agree that this agreement is

Generator Certification for the Shipment of Used Oil in Illinois
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name; and are classified, packaged, marked and labeled/placarded and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgement of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27 (a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

X Mike Brandis

CUSTOMER / GENERATOR :mike brandis

X

R000227

REFERENCE NBR.
CUSTOMER#/GENERATOR: 2370148 BRANDIS AIRCRAFT 55872250
2301 S Spresser St
Taylorville IL 62568-9291 SRVC DATE: 10/25/11
PHONE 217-824-8032
GENERATOR USEPA ID. CESQG GENERATOR STATE 0310605081
MANIFEST#: FORM CD: NR SK SHIP# 205471148
TRANSPORTER 1 TXR000050930
TRANSPORTER 2

US DOT DESCRIPTION (INCLUDING PROPER SHIPPING NAME, HAZARD CLASS, AND ID)

USED OIL
(NOT USDOT HAZARDOUS MATERIAL)
FEDERAL WASTE CODES NONE
STATE WASTE CODES
TOTAL CONT 1 TYPE TT WT/VOL G SKDO7 850
CNT#: 111025108778 QTY: 120 PROFILE: 0150105

DESIGNATED FACILITY NAME/ADDRESS:
SAFETY-KLEEN SYSTEMS, INC.
500 WEST ANTHONY DRIVE
URBANA, IL 61802

FACILITY USEPA ID NO ILD981088388
FACILITY STATE ID NO 0198270009

Used oil in drums for non-auto generators classified as high risk. Used oil certification form is required for all customers (initial sign-up and when status changes).

GENERATOR STATUS
CESQG: Vehicle

intended to satisfy the requirements of 40 CFR 262.20(e). IN THE EVENT OF AN EMERGENCY CALL 24 HR EMERGENCY # 1-800-468-1760 (Safety-Kleen Contract # 94138) Customer certifies that (i) the above-named materials are properly classified, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and (ii) no material change has occurred either in the characteristics of the waste/material or in the process generating the waste/material. Customer agrees to pay the above charges and to be bound by the terms and conditions (1) set forth in (a) the General Terms and Conditions provided separately to Customer or (b) any SK agreement signed by Customer and SK, and (2) incorporated herein by reference. Unless otherwise indicated in the payment received section, SK is authorized to charge Customer's account for this transaction. Customer certifies that the individual signing this Service Acknowledgement is duly authorized to sign and bind Customer. The following provision is applicable to Safety-Kleen's parts cleaner and paint gun cleaner services: Customer agrees that it will not introduce any substance into the solvent or aqueous cleaning solution, including without limitation any hazardous waste or hazardous waste constituent, except to the extent such introduction is incidental to the normal use of the machine. Customer further agrees that it will not clean parts/paint guns that have been contaminated with or otherwise introduce polychlorinated biphenyls (PCB's), herbicides, pesticides, dioxins or listed hazardous waste into the solvent or aqueous cleaning solution. Safety-Kleen has the capacity and is permitted to accept, store, and/or reclaim the spent parts washer solvent; paint thinners, solvents and paints generated by customer; or dry cleaning filter cartridges, powder, and still residues containing perchloroethylene, petroleum naphtha, or triflurotrichloroethane dry cleaning solvents. Safety-Kleen and customer agree that this agreement is

Generator Certification for the Shipment of Used Oil in Illinois
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgement of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27 (a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

X Mike Brandis

CUSTOMER / GENERATOR :mike brandis

X

TRANSPORTER :rrobert

LAST PAGE

R000228

LPC #0210600007 - Christian County
Taylorville/the Paint Shop
USEPA #ILD982621690
FOS FILE

LARRY'S SERVICE CENTER
710 W. SPRINGFIELD RD.
TAYLORVILLE, ILLINOIS 62568
(217) 824-9060 OR 824-6912

TIRES

CUSTOMER'S ORDER NO.	PHONE	DATE 4-18-16
NAME Brandis		
ADDRESS		

CASH	C.O.D.	CHARGE	ON ACCT.	MDSE. RET'D.	PAID OUT
Paid					

	ck # 18214		
16	Junk Tires		40.00
	Net 30 days. A finance charge of 2½% per month will be charged on unpaid balances.	TAX	
SOLD BY	RECEIVED BY	TOTAL	40.00

PRODUCT 458897

All claims and returned goods MUST be accompanied by this bill.

THANK YOU

Attachment E

TO: STEVE TOWNSEND
FAX: 557-8728
FROM: MIKE BRANDIS

RECEIVED
SPRINGFIELD REGION
MAY 21 2014
Environmental Protection Agency
STATE OF ILLINOIS

R 9:00 am

LPC #0210605081 - Christian County
Taylorville/Evergreen Aviation
FOS FILE

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE G: WASTE DISPOSAL
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER c: HAZARDOUS WASTE OPERATING REQUIREMENTS
PART 721 IDENTIFICATION AND LISTING OF HAZARDOUS WASTE
SECTION 721.104 EXCLUSIONS

Section 721.104 Exclusions

a) Materials that are not solid wastes. The following materials are not solid wastes for the purpose of this Part:

...

26) Solvent-contaminated wipes that are sent for cleaning and reuse are not solid wastes from the point of generation, provided that all of the following conditions are fulfilled:

A) The solvent-contaminated wipes, when accumulated, stored, and transported, are contained in non-leaking, closed containers that are labeled "Excluded Solvent-Contaminated Wipes". The containers must be able to contain free liquids, should free liquids occur. During accumulation, a container is considered closed when there is complete contact between the fitted lid and the rim, except when it is necessary to add or remove solvent-contaminated wipes. When the container is full, when the solvent-contaminated wipes are no longer being accumulated, or when the container is being transported, the container must be sealed with all lids properly and securely affixed to the container and all openings tightly bound or closed sufficiently to prevent leaks and emissions;

B) The solvent-contaminated wipes may be accumulated by the generator for up to 180 days from the start date of accumulation for each container prior to being sent for cleaning;

C) At the point of being sent for cleaning on-site or at the point of being transported off-site for cleaning, the solvent-contaminated wipes must contain no free liquids, as defined in 35 Ill. Adm. Code 720.110;

D) Free liquids removed from the solvent-contaminated wipes or from the container holding the wipes must be managed according to the applicable regulations found in this Part and 35 Ill. Adm. Code 720, 722 through 728, and 733;

E) Generators must maintain at their site the following documentation:

i) The name and address of the laundry or dry cleaner that is receiving the solvent-contaminated wipes;

ii) The documentation that the 180-day accumulation time limit in 35 Ill. Adm. Code 721.104(a)(26)(B) is being met; and

iii) A description of the process the generator is using to ensure that the solvent-contaminated wipes contain no free liquids at the point of being laundered or dry cleaned on-site or at the point of being transported off-site for laundering or dry cleaning; and

F) The solvent-contaminated wipes are sent to a laundry or dry cleaner whose discharge, if any, is regulated under sections 301 and 402 or section 307 of the federal Clean Water Act (33 USC 1311 and 1341 or 33 USC 1317) or equivalent Illinois or sister-state requirements approved by USEPA pursuant to 33 USC 1311 through 1346 and 1370.

ATTACHMENT G

LPC # 0210600007– Christian County
Taylorville/The Paint Shop
USEPA #ILD982621690
FOS FILE

and

LPC # 0210605081– Christian County
Taylorville/Evergreen Aviation
FOS FILE

A photocopy of the attached manifest was made on-site during the in May 16, 2014 inspection. The photocopy was not legible. The original manifest was readable so a photograph was also taken which is able to be read and is also attached to this report (see photo 0210600007~05162014-001).

lease print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number 004874712 JJK

GENERATOR

5. Generator's Name and Mailing Address — Generator's Site Address (if different than mailing address)

Generator's Phone:

6. Transporter 1 Company Name — U.S. EPA ID Number

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address — U.S. EPA ID Number

Facility's Phone:

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1.	1	DM	55	G	D002
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name — Signature — Month Day Year

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name — Signature — Month Day Year
01 07

Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name — Signature — Month Day Year

Waste Table

ATTACHMENT H

Screening Designation	DRUM TYPE	DRUM COLOR	Field pH	Head-space FID ppm	Head-space PID ppm	SAMPLE NUMBERS IEPA	- AE	SAMPLE TIME 24-Hour Clock	SEAL TIME 24-Hour Clock	WASTE VOLUME	CONTENTS
A	Pl1	B+B		221	89.1					55gal	Drum Labeled "Sludge + Pit"
B	Pl1	B+B		114	44.4					55gal	
C	Pl1	B+B		261	50.5					55gal	
D	Pl1	B+B		273	65.6					55gal	
E	Pl1	B+B		741	78.3					55gal	Drum Labeled "Striper 845"/RP claims new product
F	Pl1	B+B	3	1860	56.2	X201	S1	12:04	12:10	55gal	
G	Pl1	B+B	3	1186	119	X202	S2	12:12	12:20	55gal	
H	Stl3	K+W	4	376	122	X203	S3	12:47	12:51	55gal	Drum Labeled "Sludge, Paint Chips, Paper, Plastic"
I	Pl1	B+B	3	252	220	X204	S4	12:26	12:36	55gal	
J	Pl1	B+B	3	282	141	X205	S5	12:52	12:59	55gal	
K	Pl1	B+B		402	140					55gal	
L	Pl1	B+B		356	73.7					55gal	
M	Pl1	B+B		439	77.9					55gal	
N	Pl1	K+K		420	100					55gal	
O	Pl1	B+B		379	93.1					55gal	
P	Stl3	K+W	6	484	151	X206	S6	13:14	13:21	55gal	
Q	Pl1	B+B		439	42.4					55gal	
R	Pl1	K+K	5	412	140	X207	S7	13:22	13:31	55gal	Drum Labeled "Pit"
S	Pl1	K+K	5	128	4.28	X208	S8	12:34	13:40	55gal	Drum Labeled "E&I Rinse"
T	Pl1	B+B	5	172	77.6	X209	S9	12: 42		55gal	Drum Labeled "E&I Rinse"
U	Pl1	B+B		178	46.9					55gal	Drum Labeled "Pit"
V	Pl1	K+K	4	488	47.1	X210	S10	13:50	13:57	55gal	Drum Labeled "Outside Drums & Pit Water"
Pit1				21.5	7.0					-0-	East Sludge Pit
Pit2				10.3	3.7					4 In	West Sludge Pit
B1	B4	K	XX	---	---	X211	S11	14:20	14:26	2gal	

0210600007– Christian County Taylorville/The Paint Shop USEPA #ILD982621690 FOS FILE

and

0210605081– Christian County Taylorville/Evergreen Aviation FOS FILE

DRUM TYPES/COLORS KEY

TYPES
Pl = Plastic (Poly)
Stl= Steel
B = Bucket
1 = bung
2 = Removable lid
3 = Removable lid + bung
4 = Open

COLORS (Body + Lid)
B = Blue
K = Black
W = White

Townsend, Steve

Subject: FW: Brandis Aircraft
Attachments: sf40329 brandis aircraft.pdf

From: Townsend, Steve
Sent: Thursday, August 14, 2014 11:40 AM
To: Townsend, Steve
Subject: FW: Brandis Aircraft

LPC # 0210600007– Christian County
Taylorville/The Paint Shop
USEPA #ILD982621690
FOS FILE

LPC # 0210605081– Christian County
Taylorville/Evergreen Aviation
FOS FILE

ATTACHMENT I

From: Eisenbrandt, Paul
Sent: Monday, August 04, 2014 9:28 AM
To: Jansen, David; Townsend, Steve
Subject: FW: Brandis Aircraft

From: Neely, Matthew
Sent: Monday, August 04, 2014 9:20 AM
To: Eisenbrandt, Paul
Cc: Crowley, Celeste; Weiss, Tom
Subject: Brandis Aircraft

Paul,

I have attached a PDF of the final report for the Brandis Aircraft work order. Results with chain of custody are in the mail.

Matt

Matthew Neely
Organic Analysis Unit Supervisor
Illinois Environmental Protection Agency
matthew.neely@illinois.gov
217/782-8905
fax: 217/524-6376

Illinois Environmental Protection Agency Laboratory
825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X201**			Lab Sample ID:	**SF40329-01**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:04
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/12/14 11:16

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		1000	
Vinyl chloride	ND		1000	
Bromomethane	ND		1000	
Chloroethane	ND		1000	
Trichlorofluoromethane	ND		1000	
Acetone	**16000**		5000	
1,1-Dichloroethene	ND		1000	
Methylene chloride	**14000000**		1000000	
Carbon disulfide	ND		1000	
trans-1,2-Dichloroethene	ND		1000	
Methyl tert-butyl ether	**5300**		1000	
1,1-Dichloroethane	ND		1000	
2-Butanone (MEK) *	**10000**		5000	
cis-1,2-Dichloroethene	ND		1000	
Bromochloromethane	**1600**		1000	
Chloroform	ND		1000	
2,2-Dichloropropane	ND		1000	
1,2-Dichloroethane	ND		1000	
1,1,1-Trichloroethane	ND		1000	
1,1-Dichloropropene	ND		1000	
Carbon tetrachloride	ND		1000	
Benzene	ND		1000	
Dibromomethane	ND		1000	
1,2-Dichloropropane	ND		1000	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Test results meet all requirements of NELAC (accredited by Florida DOH #E37645). If you have any questions about this report, please contact Tom Weiss, Laboratory Manager, at 217.782.9780.

Reported:
08/04/14 08:50

Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X201**			Lab Sample ID:	**SF40329-01**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:04
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/12/14 11:16

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		1000	
Bromodichloromethane	ND		1000	
cis-1,3-Dichloropropene	ND		1000	
4-Methyl-2-pentanone (MIBK)	ND		1000	
trans-1,3-Dichloropropene	ND		1000	
1,1,2-Trichloroethane	ND		1000	
Toluene	**47000**		1000	
1,3-Dichloropropane	ND		1000	
2-Hexanone (MBK) *	ND		1000	
Dibromochloromethane	ND		1000	
1,2-Dibromoethane	ND		1000	
Tetrachloroethene	ND		1000	
1,1,1,2-Tetrachloroethane	ND		1000	
Chlorobenzene	ND		1000	
Ethylbenzene	ND		1000	
Bromoform	ND		1000	
Styrene	ND		1000	
1,1,2,2-Tetrachloroethane	ND		1000	
Xylenes, total	ND		1000	
1,2,3-Trichloropropane	ND		1000	
Isopropylbenzene	ND		1000	
Bromobenzene	ND		1000	

Reported:
08/04/14 08:50

Illinois Environmental Protection Agency Laboratory
825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X201**			Lab Sample ID:	**SF40329-01**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:04
Sample Type:		Sample Depth:		Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/16/14 12:00
Units:	°F	Analyzed:	06/16/14 12:00

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:33

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	23900		60.0	40000
Antimony	120		10.0	
Arsenic *	ND	J3	10.0	
Barium	179		5.00	
Beryllium	ND		1.00	
Boron	264		10.0	
Cadmium	4650		3.00	
Calcium	805000		300	100000
Chromium	11800		5.00	
Cobalt	29.3		10.0	
Copper	82.9		10.0	
Iron	8690		50.0	40000
Lead	132		5.00	
Magnesium	54900		300	100000
Manganese	3110		15.0	

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Reported:
08/04/14 08:50

Illinois Environmental Protection Agency Laboratory
825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT		
Project/Facility Number:	0210600007	Date Received :	06/05/14
Funding Code:	LP41	Visit Number:	
Trip ID:		Temperature C:	11.0(

Client Sample ID:	**X201**			Lab Sample ID:	**SF40329-01**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:04
Sample Type:		Sample Depth:		Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:33

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	212		5.00	
Potassium	46500		1400	100000
Selenium *	33.9		10.0	
Silver	ND		3.00	
Sodium	191000		300	
Strontium	26200		5.00	
Thallium	10.7		10.0	
Vanadium	14.3		5.00	
Zinc	24600		25.0	
Hardness	2130000		1980	

pH

Method:	150.1	Prepared:	07/07/14 12:15
Units:	PH	Analyzed:	07/07/14 13:52

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	3.1	Q	0.0	

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Reported:
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Illinois Environmental Protection Agency Laboratory
825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X202**			Lab Sample ID:	**SF40329-02**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:12
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/12/14 13:50

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		200000	
Vinyl chloride	ND		200000	
Bromomethane	ND		200000	
Chloroethane	ND		200000	
Trichlorofluoromethane	ND		200000	
Acetone	ND		1000000	
1,1-Dichloroethene	ND		200000	
Methylene chloride	**6500000**		500000	
Carbon disulfide	ND		200000	
trans-1,2-Dichloroethene	ND		200000	
Methyl tert-butyl ether	ND		200000	
1,1-Dichloroethane	ND		200000	
2-Butanone (MEK) *	ND		1000000	
cis-1,2-Dichloroethene	ND		200000	
Bromochloromethane	ND		200000	
Chloroform	ND		200000	
2,2-Dichloropropane	ND		200000	
1,2-Dichloroethane	ND		200000	
1,1,1-Trichloroethane	ND		200000	
1,1-Dichloropropene	ND		200000	
Carbon tetrachloride	ND		200000	
Benzene	ND		200000	
Dibromomethane	ND		200000	
1,2-Dichloropropane	ND		200000	

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Reported:
08/04/14 08:50

Illinois Environmental Protection Agency Laboratory

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X202**			Lab Sample ID:	**SF40329-02**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:12
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/12/14 13:50

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		200000	
Bromodichloromethane	ND		200000	
cis-1,3-Dichloropropene	ND		200000	
4-Methyl-2-pentanone (MIBK)	ND		200000	
trans-1,3-Dichloropropene	ND		200000	
1,1,2-Trichloroethane	ND		200000	
Toluene	ND		200000	
1,3-Dichloropropane	ND		200000	
2-Hexanone (MBK) *	ND		200000	
Dibromochloromethane	ND		200000	
1,2-Dibromoethane	ND		200000	
Tetrachloroethene	ND		200000	
1,1,1,2-Tetrachloroethane	ND		200000	
Chlorobenzene	ND		200000	
Ethylbenzene	ND		200000	
Bromoform	ND		200000	
Styrene	ND		200000	
1,1,2,2-Tetrachloroethane	ND		200000	
Xylenes, total	ND		200000	
1,2,3-Trichloropropane	ND		200000	
Isopropylbenzene	ND		200000	
Bromobenzene	ND		200000	

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Reported:
08/04/14 08:50

Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X202**			Lab Sample ID:	**SF40329-02**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:12
Sample Type:		Sample Depth:		Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/16/14 12:00
Units:	°F	Analyzed:	06/16/14 12:00

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:37

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**13200**		60.0	40000
Antimony	**112**		10.0	
Arsenic *	ND		10.0	
Barium	**139**		5.00	
Beryllium	**1.19**		1.00	
Boron	**270**		10.0	
Cadmium	**6230**		3.00	
Calcium	**946000**		300	100000
Chromium	**12700**		5.00	
Cobalt	**24.8**		10.0	
Copper	**420**		10.0	
Iron	**6110**		50.0	40000
Lead	**52.9**		5.00	
Magnesium	**52800**		300	100000
Manganese	**2330**		15.0	

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Reported:
08/04/14 08:50

Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X202**			Lab Sample ID:	**SF40329-02**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:12
Sample Type:		Sample Depth:		Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:37

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	**231**		5.00	
Potassium	**23900**		1400	100000
Selenium *	**10.5**		10.0	
Silver	ND		3.00	
Sodium	**189000**		300	
Strontium	**27700**		5.00	
Thallium	ND		10.0	
Vanadium	ND		5.00	
Zinc	**24000**		25.0	
Hardness	**2290000**		1980	

pH

Method:	150.1	Prepared:	07/07/14 12:15
Units:	PH	Analyzed:	07/07/14 13:52

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**3.1**	Q	0.0	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Test results meet all requirements of NELAC (accredited by Florida DOH #E37645). If you have any questions about this report, please contact Tom Weiss, Laboratory Manager, at 217.782.9780.

Reported:
08/04/14 08:50

Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X203**			Lab Sample ID:	**SF40329-03**
Matrix:	Solid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:47
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/kg wet	Analyzed:	06/17/14 11:31

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		200	
Vinyl chloride	ND		200	
Bromomethane	ND		200	
Chloroethane	ND		200	
Trichlorofluoromethane	ND		200	
Acetone	ND		1000	
1,1-Dichloroethene	ND		200	
Methylene chloride	**16000000**		500000	
Carbon disulfide	ND		200	
trans-1,2-Dichloroethene	ND		200	
Methyl tert-butyl ether	ND		200	
1,1-Dichloroethane	ND		200	
2-Butanone (MEK) *	**3500**		1000	
cis-1,2-Dichloroethene	ND		200	
Bromochloromethane	**440**		200	
Chloroform	ND		200	
2,2-Dichloropropane	ND		200	
1,2-Dichloroethane	ND		200	
1,1,1-Trichloroethane	ND		200	
1,1-Dichloropropene	ND		200	
Carbon tetrachloride	ND		200	
Benzene	ND		200	
Dibromomethane	ND		200	
1,2-Dichloropropane	ND		200	

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Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0C
Client Sample ID:	X203			Lab Sample ID:	SF40329-03
Matrix:	Solid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:47
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/kg wet	Analyzed:	06/17/14 11:31

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	**2100**		200	
Bromodichloromethane	ND		200	
cis-1,3-Dichloropropene	ND		200	
4-Methyl-2-pentanone (MIBK)	**290**		200	
trans-1,3-Dichloropropene	ND		200	
1,1,2-Trichloroethane	ND		200	
Toluene	**6500000**	J1	200000	
1,3-Dichloropropane	ND		200	
2-Hexanone (MBK) *	ND		200	
Dibromochloromethane	ND		200	
1,2-Dibromoethane	ND		200	
Tetrachloroethene	**1900**		200	
1,1,1,2-Tetrachloroethane	ND		200	
Chlorobenzene	**620**		200	
Ethylbenzene	**570**		200	
Bromoform	ND		200	
Styrene	**210**		200	
1,1,2,2-Tetrachloroethane	ND		200	
Xylenes, total	**2600**		200	
1,2,3-Trichloropropane	ND		200	
Isopropylbenzene	ND		200	
Bromobenzene	ND		200	

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Reported:
08/04/14 08:50

Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X203**			Lab Sample ID:	**SF40329-03**
Matrix:	Solid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:47
Sample Type:		Sample Depth:		Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/18/14 10:30
Units:	°F	Analyzed:	06/18/14 10:30

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA Method 6010 - ICP

Method:	SW-846 6010	Prepared:	06/10/14 13:26
Units:	mg/kg wet	Analyzed:	06/18/14 13:09

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**6100**		9.26	
Arsenic *	ND	B1, J3	1.85	
Barium	**1370**		0.46	
Beryllium	ND		0.09	
Boron	ND	B2	4.63	
Cadmium	**36.1**	B2	0.46	
Calcium	**2970**		27.8	
Chromium	**1600**		0.46	
Cobalt	**1.34**		0.93	
Copper	**97.7**	B1	0.93	
Iron	**4720**		92.6	
Lead	**699**	B1	0.46	
Magnesium	**1090**		46.3	
Manganese	**71.8**		1.39	
Nickel	**13.0**		0.46	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X203**			Lab Sample ID:	**SF40329-03**
Matrix:	Solid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:47
Sample Type:		Sample Depth:		Total Depth:	0

Metals by EPA Method 6010 - ICP

Method:	SW-846 6010	Prepared:	06/10/14 13:26
Units:	mg/kg wet	Analyzed:	06/18/14 13:09

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Potassium	ND		185	
Silver	**0.47**		0.46	
Sodium	**388**		185	
Strontium	**1250**		0.46	
Vanadium	**4.36**		0.46	
Zinc	**331**		4.63	
Antimony	**15.7**	J3	1.85	
Selenium *	ND	B1	1.85	
Thallium	ND		1.85	

pH

Method:	150.1	Prepared:	08/01/14 15:08
Units:	PH	Analyzed:	08/01/14 15:10

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**4.0**	Q	0.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X204**			Lab Sample ID:	**SF40329-04**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:26
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 12:50

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		20000	
Vinyl chloride	ND		20000	
Bromomethane	ND		20000	
Chloroethane	ND		20000	
Trichlorofluoromethane	ND		20000	
Acetone	ND		100000	
1,1-Dichloroethene	ND		20000	
Methylene chloride	**630000**		50000	
Carbon disulfide	ND		20000	
trans-1,2-Dichloroethene	ND		20000	
Methyl tert-butyl ether	ND		20000	
1,1-Dichloroethane	ND		20000	
2-Butanone (MEK) *	**220000**		100000	
cis-1,2-Dichloroethene	ND		20000	
Bromochloromethane	ND		20000	
Chloroform	ND		20000	
2,2-Dichloropropane	ND		20000	
1,2-Dichloroethane	ND		20000	
1,1,1-Trichloroethane	ND		20000	
1,1-Dichloropropene	ND		20000	
Carbon tetrachloride	ND		20000	
Benzene	ND		20000	
Dibromomethane	ND		20000	
1,2-Dichloropropane	ND		20000	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X204**			Lab Sample ID:	**SF40329-04**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:26
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 12:50

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		20000	
Bromodichloromethane	ND		20000	
cis-1,3-Dichloropropene	ND		20000	
4-Methyl-2-pentanone (MIBK)	ND		20000	
trans-1,3-Dichloropropene	ND		20000	
1,1,2-Trichloroethane	ND		20000	
Toluene	**39000**		20000	
1,3-Dichloropropane	ND		20000	
2-Hexanone (MBK) *	ND		20000	
Dibromochloromethane	ND		20000	
1,2-Dibromoethane	ND		20000	
Tetrachloroethene	ND		20000	
1,1,1,2-Tetrachloroethane	ND		20000	
Chlorobenzene	ND		20000	
Ethylbenzene	ND		20000	
Bromoform	ND		20000	
Styrene	ND		20000	
1,1,2,2-Tetrachloroethane	ND		20000	
Xylenes, total	ND		20000	
1,2,3-Trichloropropane	ND		20000	
Isopropylbenzene	ND		20000	
Bromobenzene	ND		20000	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X204**			Lab Sample ID:	**SF40329-04**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:26
Sample Type:		Sample Depth:		Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/16/14 12:00
Units:	°F	Analyzed:	06/16/14 12:00

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:42

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**11900**		60.0	40000
Antimony	**308**		10.0	
Arsenic *	ND		10.0	
Barium	**474**		5.00	
Beryllium	ND		1.00	
Boron	**299**		10.0	
Cadmium	**2270**		3.00	
Calcium	**519000**		300	100000
Chromium	**37800**		5.00	
Cobalt	**23.8**		10.0	
Copper	**283**		10.0	
Iron	**1190**		50.0	40000
Lead	**63.0**		5.00	
Magnesium	**45100**		300	100000
Manganese	**2130**		15.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X204**			Lab Sample ID:	**SF40329-04**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:26
Sample Type:		Sample Depth:		Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:42

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	**128**		5.00	
Potassium	**10100**		1400	100000
Selenium *	**16.8**		10.0	
Silver	ND		3.00	
Sodium	**108000**		300	
Strontium	**64100**		5.00	
Thallium	ND		10.0	
Vanadium	ND		5.00	
Zinc	**5470**		25.0	
Hardness	**1280000**		1980	

pH

Method:	150.1	Prepared:	07/07/14 12:15
Units:	PH	Analyzed:	07/07/14 13:52

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**3.4**	Q	0.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X205**			Lab Sample ID:	**SF40329-05**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:52
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 13:21

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		20000	
Vinyl chloride	ND		20000	
Bromomethane	ND		20000	
Chloroethane	ND		20000	
Trichlorofluoromethane	ND		20000	
Acetone	ND		1000000	
1,1-Dichloroethene	ND		20000	
Methylene chloride	**3900000**		500000	
Carbon disulfide	ND		20000	
trans-1,2-Dichloroethene	ND		20000	
Methyl tert-butyl ether	ND		20000	
1,1-Dichloroethane	ND		20000	
2-Butanone (MEK) *	ND		100000	
cis-1,2-Dichloroethene	ND		20000	
Bromochloromethane	ND		20000	
Chloroform	ND		20000	
2,2-Dichloropropane	ND		20000	
1,2-Dichloroethane	ND		20000	
1,1,1-Trichloroethane	ND		20000	
1,1-Dichloropropene	ND		20000	
Carbon tetrachloride	ND		20000	
Benzene	ND		20000	
Dibromomethane	ND		20000	
1,2-Dichloropropane	ND		20000	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	X205			Lab Sample ID:	SF40329-05
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:52
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 13:21

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		20000	
Bromodichloromethane	ND		20000	
cis-1,3-Dichloropropene	ND		20000	
4-Methyl-2-pentanone (MIBK)	ND		20000	
trans-1,3-Dichloropropene	ND		20000	
1,1,2-Trichloroethane	ND		20000	
Toluene	**96000**		20000	
1,3-Dichloropropane	ND		20000	
2-Hexanone (MBK) *	ND		20000	
Dibromochloromethane	ND		20000	
1,2-Dibromoethane	ND		20000	
Tetrachloroethene	ND		20000	
1,1,1,2-Tetrachloroethane	ND		20000	
Chlorobenzene	ND		20000	
Ethylbenzene	ND		20000	
Bromoform	ND		20000	
Styrene	ND		20000	
1,1,2,2-Tetrachloroethane	ND		20000	
Xylenes, total	ND		20000	
1,2,3-Trichloropropane	ND		20000	
Isopropylbenzene	ND		20000	
Bromobenzene	ND		20000	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X205**			Lab Sample ID:	**SF40329-05**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:52
Sample Type:		Sample Depth:		Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/18/14 10:30
Units:	°F	Analyzed:	06/18/14 10:30

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:46

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**17400**		60.0	40000
Antimony	**143**		10.0	
Arsenic *	ND		10.0	
Barium	**428**		5.00	
Beryllium	ND		1.00	
Boron	**311**		10.0	
Cadmium	**1620**		3.00	
Calcium	**369000**		300	100000
Chromium	**17700**		5.00	
Cobalt	**20.9**		10.0	
Copper	**201**		10.0	
Iron	**6130**		50.0	40000
Lead	**49.8**		5.00	
Magnesium	**37700**		300	100000
Manganese	**1640**		15.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	X205			Lab Sample ID:	SF40329-05
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:52
Sample Type:		Sample Depth:		Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:46

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	92.2		5.00	
Potassium	9830		1400	100000
Selenium *	30.2		10.0	
Silver	ND		3.00	
Sodium	133000		300	
Strontium	33800		5.00	
Thallium	ND		10.0	
Vanadium	ND		5.00	
Zinc	5530		25.0	
Hardness	1080000		1980	

pH

Method:	150.1	Prepared:	07/07/14 12:15
Units:	PH	Analyzed:	07/07/14 13:52

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	3.1	Q	0.0	

Reported:
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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X206**			Lab Sample ID:	**SF40329-06**
Matrix:	Solid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:14
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/kg wet	Analyzed:	06/17/14 13:51

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND	J1	17000	
Vinyl chloride	ND	J1	17000	
Bromomethane	ND	J1	17000	
Chloroethane	ND	J1	17000	
Trichlorofluoromethane	ND	J1	17000	
Acetone	ND	J1	86000	
1,1-Dichloroethene	ND	J1	17000	
Methylene chloride	**920000**	J1	43000	
Carbon disulfide	ND	J1	17000	
trans-1,2-Dichloroethene	ND	J1	17000	
Methyl tert-butyl ether	ND	J1	17000	
1,1-Dichloroethane	ND	J1	17000	
2-Butanone (MEK) *	**180000**	J1	86000	
cis-1,2-Dichloroethene	ND	J1	17000	
Bromochloromethane	ND	J1	17000	
Chloroform	ND	J1	17000	
2,2-Dichloropropane	ND	J1	17000	
1,2-Dichloroethane	ND	J1	17000	
1,1,1-Trichloroethane	ND	J1	17000	
1,1-Dichloropropene	ND	J1	17000	
Carbon tetrachloride	ND	J1	17000	
Benzene	ND	J1	17000	
Dibromomethane	ND	J1	17000	
1,2-Dichloropropane	ND	J1	17000	

Reported:
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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X206**			Lab Sample ID:	**SF40329-06**
Matrix:	Solid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:14
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/kg wet	Analyzed:	06/17/14 13:51

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND	J1	17000	
Bromodichloromethane	ND	J1	17000	
cis-1,3-Dichloropropene	ND	J1	17000	
4-Methyl-2-pentanone (MIBK)	ND	J1	17000	
trans-1,3-Dichloropropene	ND	J1	17000	
1,1,2-Trichloroethane	ND	J1	17000	
Toluene	**6700000**	J1	170000	
1,3-Dichloropropane	ND	J1	17000	
2-Hexanone (MBK) *	ND	J1	17000	
Dibromochloromethane	ND	J1	17000	
1,2-Dibromoethane	ND	J1	17000	
Tetrachloroethene	ND	J1	17000	
1,1,1,2-Tetrachloroethane	ND	J1	17000	
Chlorobenzene	ND	J1	17000	
Ethylbenzene	ND	J1	17000	
Bromoform	ND	J1	17000	
Styrene	ND	J1	17000	
1,1,2,2-Tetrachloroethane	ND	J1	17000	
Xylenes, total	ND	J1	17000	
1,2,3-Trichloropropane	ND	J1	17000	
Isopropylbenzene	ND	J1	17000	
Bromobenzene	ND	J1	17000	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X206**			Lab Sample ID:	**SF40329-06**
Matrix:	Solid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:14
Sample Type:		Sample Depth:		Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/18/14 10:30
Units:	°F	Analyzed:	06/18/14 10:30

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA Method 6010 - ICP

Method:	SW-846 6010	Prepared:	06/10/14 13:26
Units:	mg/kg wet	Analyzed:	06/18/14 13:16

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**6170**		9.43	
Arsenic *	ND	B1	1.89	
Barium	**1400**		0.47	
Beryllium	ND		0.09	
Boron	ND	B2	4.72	
Cadmium	**119**	B2	0.47	
Calcium	**6270**		28.3	
Chromium	**1630**		0.47	
Cobalt	**1.68**		0.94	
Copper	**113**	B1	0.94	
Iron	**13200**		94.3	
Lead	**680**	B1	0.47	
Magnesium	**1510**		47.2	
Manganese	**81.2**		1.42	
Nickel	**21.5**		0.47	

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Reported:
08/04/14 08:50

Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X206**			Lab Sample ID:	**SF40329-06**
Matrix:	Solid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:14
Sample Type:		Sample Depth:		Total Depth:	0

Metals by EPA Method 6010 - ICP

Method:	SW-846 6010	Prepared:	06/10/14 13:26
Units:	mg/kg wet	Analyzed:	06/18/14 13:16

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Potassium	**189**		189	
Silver	ND		0.47	
Sodium	**267**		189	
Strontium	**1430**		0.47	
Vanadium	**3.43**		0.47	
Zinc	**744**		4.72	
Antimony	**16.4**		1.89	
Selenium *	ND	B1	1.89	
Thallium	ND		1.89	

pH

Method:	150.1	Prepared:	08/01/14 15:08
Units:	PH	Analyzed:	08/01/14 15:10

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**5.8**	Q	0.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X207**			Lab Sample ID:	**SF40329-07**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:22
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/16/14 14:53

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		20000	
Vinyl chloride	ND		20000	
Bromomethane	ND		20000	
Chloroethane	ND		20000	
Trichlorofluoromethane	ND		20000	
Acetone	ND		100000	
1,1-Dichloroethene	ND		20000	
Methylene chloride	**550000**		50000	
Carbon disulfide	ND		20000	
trans-1,2-Dichloroethene	ND		20000	
Methyl tert-butyl ether	ND		20000	
1,1-Dichloroethane	ND		20000	
2-Butanone (MEK) *	ND		100000	
cis-1,2-Dichloroethene	ND		20000	
Bromochloromethane	ND		20000	
Chloroform	ND		20000	
2,2-Dichloropropane	ND		20000	
1,2-Dichloroethane	ND		20000	
1,1,1-Trichloroethane	ND		20000	
1,1-Dichloropropene	ND		20000	
Carbon tetrachloride	ND		20000	
Benzene	ND		20000	
Dibromomethane	ND		20000	
1,2-Dichloropropane	ND		20000	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X207**			Lab Sample ID:	**SF40329-07**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:22
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/16/14 14:53

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		20000	
Bromodichloromethane	ND		20000	
cis-1,3-Dichloropropene	ND		20000	
4-Methyl-2-pentanone (MIBK)	ND		20000	
trans-1,3-Dichloropropene	ND		20000	
1,1,2-Trichloroethane	ND		20000	
Toluene	**24000**		20000	
1,3-Dichloropropane	ND		20000	
2-Hexanone (MBK) *	ND		20000	
Dibromochloromethane	ND		20000	
1,2-Dibromoethane	ND		20000	
Tetrachloroethene	ND		20000	
1,1,1,2-Tetrachloroethane	ND		20000	
Chlorobenzene	ND		20000	
Ethylbenzene	ND		20000	
Bromoform	ND		20000	
Styrene	ND		20000	
1,1,2,2-Tetrachloroethane	ND		20000	
Xylenes, total	ND		20000	
1,2,3-Trichloropropane	ND		20000	
Isopropylbenzene	ND		20000	
Bromobenzene	ND		20000	

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825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X207**			Lab Sample ID:	**SF40329-07**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:22
Sample Type:		Sample Depth:		Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/18/14 10:30
Units:	°F	Analyzed:	06/18/14 10:30

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:50

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**12200**		60.0	40000
Antimony	**254**		10.0	
Arsenic *	ND		10.0	
Barium	**221**		5.00	
Beryllium	ND		1.00	
Boron	**425**		10.0	
Cadmium	**7470**		3.00	
Calcium	**1340000**		300	100000
Chromium	**24200**		5.00	
Cobalt	**40.4**		10.0	
Copper	**373**		10.0	
Iron	**1650**		50.0	40000
Lead	**24.6**		5.00	
Magnesium	**81600**		300	100000
Manganese	**4840**		15.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0C
Client Sample ID:	**X207**			Lab Sample ID:	**SF40329-07**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:22
Sample Type:		Sample Depth:		Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:50

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	**380**		5.00	
Potassium	**24700**		1400	100000
Selenium *	**20.1**		10.0	
Silver	ND		3.00	
Sodium	**130000**		300	
Strontium	**61300**		5.00	
Thallium	ND		10.0	
Vanadium	ND		5.00	
Zinc	**27900**		25.0	
Hardness	**3000000**		1980	

pH

Method:	150.1	Prepared:	07/07/14 12:15
Units:	PH	Analyzed:	07/07/14 13:52

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**4.1**	Q	0.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X208**			Lab Sample ID:	**SF40329-08**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:34
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/16/14 15:24

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		20000	
Vinyl chloride	ND		20000	
Bromomethane	ND		20000	
Chloroethane	ND		20000	
Trichlorofluoromethane	ND		20000	
Acetone	ND		100000	
1,1-Dichloroethene	ND		20000	
Methylene chloride	**520000**		50000	
Carbon disulfide	ND		20000	
trans-1,2-Dichloroethene	ND		20000	
Methyl tert-butyl ether	ND		20000	
1,1-Dichloroethane	ND		20000	
2-Butanone (MEK) *	ND		100000	
cis-1,2-Dichloroethene	ND		20000	
Bromochloromethane	ND		20000	
Chloroform	ND		20000	
2,2-Dichloropropane	ND		20000	
1,2-Dichloroethane	ND		20000	
1,1,1-Trichloroethane	ND		20000	
1,1-Dichloropropene	ND		20000	
Carbon tetrachloride	ND		20000	
Benzene	ND		20000	
Dibromomethane	ND		20000	
1,2-Dichloropropane	ND		20000	

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825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X208**			Lab Sample ID:	**SF40329-08**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:34
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/16/14 15:24

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		20000	
Bromodichloromethane	ND		20000	
cis-1,3-Dichloropropene	ND		20000	
4-Methyl-2-pentanone (MIBK)	ND		20000	
trans-1,3-Dichloropropene	ND		20000	
1,1,2-Trichloroethane	ND		20000	
Toluene	**27000**		20000	
1,3-Dichloropropane	ND		20000	
2-Hexanone (MBK) *	ND		20000	
Dibromochloromethane	ND		20000	
1,2-Dibromoethane	ND		20000	
Tetrachloroethene	ND		20000	
1,1,1,2-Tetrachloroethane	ND		20000	
Chlorobenzene	ND		20000	
Ethylbenzene	ND		20000	
Bromoform	ND		20000	
Styrene	ND		20000	
1,1,2,2-Tetrachloroethane	ND		20000	
Xylenes, total	ND		20000	
1,2,3-Trichloropropane	ND		20000	
Isopropylbenzene	ND		20000	
Bromobenzene	ND		20000	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	X208			Lab Sample ID:	SF40329-08
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:34
Sample Type:		Sample Depth:		Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/18/14 10:30
Units:	°F	Analyzed:	06/18/14 10:30

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:54

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	48200		60.0	40000
Antimony	245		10.0	
Arsenic *	ND		10.0	
Barium	1280		5.00	
Beryllium	ND		1.00	
Boron	306		10.0	
Cadmium	10800		3.00	
Calcium	455000		300	100000
Chromium	26200		5.00	
Cobalt	20.9		10.0	
Copper	357		10.0	
Iron	5080		50.0	40000
Lead	66.7		5.00	
Magnesium	43100		300	100000
Manganese	1660		15.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0(
Client Sample ID:	**X208**		Lab Sample ID:	**SF40329-08**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:34
Sample Type:		Sample Depth:	Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:54

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	**278**		5.00	
Potassium	**20700**		1400	100000
Selenium *	ND		10.0	
Silver	ND		3.00	
Sodium	**58400**		300	
Strontium	**16600**		5.00	
Thallium	ND		10.0	
Vanadium	ND		5.00	
Zinc	**4220**		25.0	
Hardness	**1310000**		1980	

pH

Method:	150.1	Prepared:	07/07/14 12:15
Units:	PH	Analyzed:	07/07/14 13:52

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**4.3**	Q	0.0	

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Illinois Environmental Protection Agency Laboratory

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X209**			Lab Sample ID:	**SF40329-09**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:42
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 12:18

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		200	
Vinyl chloride	ND		200	
Bromomethane	ND		200	
Chloroethane	ND		200	
Trichlorofluoromethane	ND		200	
Acetone	ND		1000	
1,1-Dichloroethene	ND		200	
Methylene chloride	**15000**		500	
Carbon disulfide	ND		200	
trans-1,2-Dichloroethene	ND		200	
Methyl tert-butyl ether	ND		200	
1,1-Dichloroethane	ND		200	
2-Butanone (MEK) *	**20000**	L	1000	
cis-1,2-Dichloroethene	ND		200	
Bromochloromethane	ND		200	
Chloroform	ND		200	
2,2-Dichloropropane	ND		200	
1,2-Dichloroethane	ND		200	
1,1,1-Trichloroethane	ND		200	
1,1-Dichloropropene	ND		200	
Carbon tetrachloride	ND		200	
Benzene	ND		200	
Dibromomethane	ND		200	
1,2-Dichloropropane	ND		200	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X209**			Lab Sample ID:	**SF40329-09**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:42
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 12:18

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		200	
Bromodichloromethane	ND		200	
cis-1,3-Dichloropropene	ND		200	
4-Methyl-2-pentanone (MIBK)	ND		200	
trans-1,3-Dichloropropene	ND		200	
1,1,2-Trichloroethane	ND		200	
Toluene	**7200**		200	
1,3-Dichloropropane	ND		200	
2-Hexanone (MBK) *	ND		200	
Dibromochloromethane	ND		200	
1,2-Dibromoethane	ND		200	
Tetrachloroethene	ND		200	
1,1,1,2-Tetrachloroethane	ND		200	
Chlorobenzene	ND		200	
Ethylbenzene	ND		200	
Bromoform	ND		200	
Styrene	ND		200	
1,1,2,2-Tetrachloroethane	ND		200	
Xylenes, total	ND		200	
1,2,3-Trichloropropane	ND		200	
Isopropylbenzene	ND		200	
Bromobenzene	ND		200	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0C
Client Sample ID:	**X209**			Lab Sample ID:	**SF40329-09**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:42
Sample Type:		Sample Depth:		Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/18/14 10:30
Units:	°F	Analyzed:	06/18/14 10:30

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 13:04

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**11300**		60.0	40000
Antimony	**473**		10.0	
Arsenic *	ND		10.0	
Barium	**299**		5.00	
Beryllium	ND		1.00	
Boron	**266**		10.0	
Cadmium	**7440**		3.00	
Calcium	**678000**		300	100000
Chromium	**51700**		5.00	
Cobalt	**25.6**		10.0	
Copper	**116**		10.0	
Iron	**5430**		50.0	40000
Lead	ND		5.00	
Magnesium	**47700**		300	100000
Manganese	**1240**		15.0	

Reported:
08/04/14 08:50

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X209**			Lab Sample ID:	**SF40329-09**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:42
Sample Type:		Sample Depth:		Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 13:04

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	**198**		5.00	
Potassium	**30500**		1400	100000
Selenium *	ND		10.0	
Silver	ND		3.00	
Sodium	**58300**		300	
Strontium	**19600**		5.00	
Thallium	**10.7**		10.0	
Vanadium	ND		5.00	
Zinc	**766**		25.0	
Hardness	**1820000**		1980	

pH

Method:	150.1	Prepared:	07/07/14 12:15
Units:	PH	Analyzed:	07/07/14 13:52

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**4.8**	Q	0.0	

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Reported:
08/04/14 08:50

Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X210**			Lab Sample ID:	**SF40329-10**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:50
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 13:53

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		20000	
Vinyl chloride	ND		20000	
Bromomethane	ND		20000	
Chloroethane	ND		20000	
Trichlorofluoromethane	ND		20000	
Acetone	ND		100000	
1,1-Dichloroethene	ND		20000	
Methylene chloride	**1200000**		50000	
Carbon disulfide	ND		20000	
trans-1,2-Dichloroethene	ND		20000	
Methyl tert-butyl ether	ND		20000	
1,1-Dichloroethane	ND		20000	
2-Butanone (MEK) *	ND		100000	
cis-1,2-Dichloroethene	ND		20000	
Bromochloromethane	ND		20000	
Chloroform	ND		20000	
2,2-Dichloropropane	ND		20000	
1,2-Dichloroethane	ND		20000	
1,1,1-Trichloroethane	ND		20000	
1,1-Dichloropropene	ND		20000	
Carbon tetrachloride	ND		20000	
Benzene	ND		20000	
Dibromomethane	ND		20000	
1,2-Dichloropropane	ND		20000	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X210**			Lab Sample ID:	**SF40329-10**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:50
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 13:53

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		20000	
Bromodichloromethane	ND		20000	
cis-1,3-Dichloropropene	ND		20000	
4-Methyl-2-pentanone (MIBK)	ND		20000	
trans-1,3-Dichloropropene	ND		20000	
1,1,2-Trichloroethane	ND		20000	
Toluene	**56000**		20000	
1,3-Dichloropropane	ND		20000	
2-Hexanone (MBK) *	ND		20000	
Dibromochloromethane	ND		20000	
1,2-Dibromoethane	ND		20000	
Tetrachloroethene	ND		20000	
1,1,1,2-Tetrachloroethane	ND		20000	
Chlorobenzene	ND		20000	
Ethylbenzene	ND		20000	
Bromoform	ND		20000	
Styrene	ND		20000	
1,1,2,2-Tetrachloroethane	ND		20000	
Xylenes, total	ND		20000	
1,2,3-Trichloropropane	ND		20000	
Isopropylbenzene	ND		20000	
Bromobenzene	ND		20000	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0C
Client Sample ID:	**X210**			Lab Sample ID:	**SF40329-10**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:50
Sample Type:		Sample Depth:		Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/18/14 10:30
Units:	°F	Analyzed:	06/18/14 10:30

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 13:08

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**17000**		60.0	40000
Antimony	**161**		10.0	
Arsenic *	ND		10.0	
Barium	**416**		5.00	
Beryllium	ND		1.00	
Boron	**288**		10.0	
Cadmium	**1840**		3.00	
Calcium	**554000**		300	100000
Chromium	**15700**		5.00	
Cobalt	**32.2**		10.0	
Copper	**280**		10.0	
Iron	**12800**		50.0	40000
Lead	**148**		5.00	
Magnesium	**50900**		300	100000
Manganese	**1450**		15.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X210**			Lab Sample ID:	**SF40329-10**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:50
Sample Type:		Sample Depth:		Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 13:08

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	**173**		5.00	
Potassium	**65900**		1400	100000
Selenium *	ND		10.0	
Silver	ND		3.00	
Sodium	**74800**		300	
Strontium	**21000**		5.00	
Thallium	ND		10.0	
Vanadium	ND		5.00	
Zinc	**7830**		25.0	
Hardness	**1540000**		1980	

pH

Method:	150.1	Prepared:	08/01/14 15:08
Units:	PH	Analyzed:	08/01/14 15:10

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**4.2**	Q	0.0	

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Illinois Environmental Protection Agency Laboratory

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0C
Client Sample ID:	**X211**			Lab Sample ID:	**SF40329-11**
Matrix:	Organic Liquid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 14:20
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/kg	Analyzed:	06/17/14 18:08

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		93000	
Vinyl chloride	ND	J7	93000	
Bromomethane	ND		93000	
Chloroethane	ND		93000	
Trichlorofluoromethane	ND		93000	
Acetone	**1700000**		460000	
1,1-Dichloroethene	ND		93000	
Methylene chloride	ND		230000	
Carbon disulfide	ND		93000	
trans-1,2-Dichloroethene	ND		93000	
Methyl tert-butyl ether	ND		93000	
1,1-Dichloroethane	ND		93000	
2-Butanone (MEK) *	**65000000**	J1	4600000	
cis-1,2-Dichloroethene	ND		93000	
Bromochloromethane	ND		93000	
Chloroform	ND		93000	
2,2-Dichloropropane	ND		93000	
1,2-Dichloroethane	ND		93000	
1,1,1-Trichloroethane	ND		93000	
1,1-Dichloropropene	ND		93000	
Carbon tetrachloride	ND		93000	
Benzene	ND		93000	
Dibromomethane	ND		93000	
1,2-Dichloropropane	ND		93000	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0C
Client Sample ID:	**X211**			Lab Sample ID:	**SF40329-11**
Matrix:	Organic Liquid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 14:20
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/kg	Analyzed:	06/17/14 18:08

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		93000	
Bromodichloromethane	ND		93000	
cis-1,3-Dichloropropene	ND		93000	
4-Methyl-2-pentanone (MIBK)	**11000000**	J1	930000	
trans-1,3-Dichloropropene	ND		93000	
1,1,2-Trichloroethane	ND		93000	
Toluene	**14000000**	J1	930000	
1,3-Dichloropropane	ND		93000	
2-Hexanone (MBK) *	ND		93000	
Dibromochloromethane	ND		93000	
1,2-Dibromoethane	ND		93000	
Tetrachloroethene	ND		93000	
1,1,1,2-Tetrachloroethane	ND		93000	
Chlorobenzene	ND		93000	
Ethylbenzene	**1900000**		93000	
Bromoform	ND		93000	
Styrene	ND		93000	
1,1,2,2-Tetrachloroethane	ND		93000	
Xylenes, total	**13000000**		93000	
1,2,3-Trichloropropane	ND		93000	
Isopropylbenzene	ND		93000	
Bromobenzene	ND		93000	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X211**			Lab Sample ID:	**SF40329-11**
Matrix:	Organic Liquid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 14:20
Sample Type:		Sample Depth:		Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/17/14 10:30
Units:	°F	Analyzed:	06/17/14 13:00

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	<70		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/30/14 07:41
Units:	ug/L	Analyzed:	07/11/14 11:41

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**21900**	J3	60.0	40000
Antimony	ND	J3	10.0	
Arsenic *	ND	J3	10.0	
Barium	**565**	J3	5.00	
Beryllium	ND	J3	1.00	
Boron	**15.3**	J3	10.0	
Cadmium	**156**	J3	3.00	
Calcium	ND	J3	300	100000
Chromium	**19100**	J3	5.00	
Cobalt	**595**	J3	10.0	
Copper	**137**	J3	10.0	
Iron	**353000**	J3	50.0	40000
Lead	ND	J3	5.00	
Magnesium	ND	J3	300	100000
Manganese	**315**	J3	15.0	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**X211**			Lab Sample ID:	**SF40329-11**
Matrix:	Organic Liquid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 14:20
Sample Type:		Sample Depth:		Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/30/14 07:41
Units:	ug/L	Analyzed:	07/11/14 11:41

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	ND	J3	5.00	
Potassium	**7970**	J3	1400	100000
Selenium *	**2380**	J3	10.0	
Silver	ND	J3	3.00	
Sodium	**3090**	J3	300	
Strontium	**2400**	J3	5.00	
Thallium	**55.1**	J3	10.0	
Vanadium	ND	J3	5.00	
Zinc	**56000**	J3	25.0	
Hardness	ND		1980	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0(
Client Sample ID:	**TRIP BLANK**			Lab Sample ID:	**SF40329-12**
Matrix:	Water	Collected By:		Date/Time Collected:	06/05/14 0:00
Sample Type:		Sample Depth:		Total Depth:	

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/09/14 10:00
Units:	ug/L	Analyzed:	06/09/14 16:22

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		2.0	
Vinyl chloride	ND		2.0	
Bromomethane	ND		2.0	
Chloroethane	ND		2.0	
Trichlorofluoromethane	ND		2.0	
Acetone	ND		10	
1,1-Dichloroethene	ND		2.0	
Methylene chloride	ND		5.0	
Carbon disulfide	ND		2.0	
trans-1,2-Dichloroethene	ND		2.0	
Methyl tert-butyl ether	ND		2.0	
1,1-Dichloroethane	ND		2.0	
2-Butanone (MEK) *	ND		10	
cis-1,2-Dichloroethene	ND		2.0	
Bromochloromethane	ND		2.0	
Chloroform	ND		2.0	
2,2-Dichloropropane	ND		2.0	
1,2-Dichloroethane	ND		2.0	
1,1,1-Trichloroethane	ND		2.0	
1,1-Dichloropropene	ND		2.0	
Carbon tetrachloride	ND		2.0	
Benzene	ND		2.0	
Dibromomethane	ND		2.0	
1,2-Dichloropropane	ND		2.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0(
Client Sample ID:	**TRIP BLANK**		Lab Sample ID:	**SF40329-12**
Matrix:	Water	Collected By:	Date/Time Collected:	06/05/14 0:00
Sample Type:		Sample Depth:	Total Depth:	

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/09/14 10:00
Units:	ug/L	Analyzed:	06/09/14 16:22

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		2.0	
Bromodichloromethane	ND		2.0	
cis-1,3-Dichloropropene	ND		2.0	
4-Methyl-2-pentanone (MIBK)	ND		2.0	
trans-1.3-Dichloropropene	ND		2.0	
1,1,2-Trichloroethane	ND		2.0	
Toluene	ND		2.0	
1,3-Dichloropropane	ND		2.0	
2-Hexanone (MBK) *	ND		2.0	
Dibromochloromethane	ND		2.0	
1,2-Dibromoethane	ND		2.0	
Tetrachloroethene	ND		2.0	
1,1,1,2-Tetrachloroethane	ND		2.0	
Chlorobenzene	ND		2.0	
Ethylbenzene	ND		2.0	
Bromoform	ND		2.0	
Styrene	ND		2.0	
1,1,2,2-Tetrachloroethane	ND		2.0	
Xylenes, total	ND		2.0	
1,2,3-Trichloropropane	ND		2.0	
Isopropylbenzene	ND		2.0	
Bromobenzene	ND		2.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT		
Project/Facility Number:	0210600007	Date Received :	06/05/14
Funding Code:	LP41	Visit Number:	
Trip ID:		Temperature C:	11.0(

Notes and Definitions

Q	Maximum holding time exceeded.
L	Actual value not known, but known to be greater than value shown. Value shown is the highest acceptable level for quantitation. (For bacteria, result calculated as if the smallest filtration volume had a count of 200).
J7	Blank spike failed low - possible low bias or false non-detect result.
J3	The reported value failed to meet the established quality control criteria for either precision or accuracy possibly due to matrix effects.
J1	Surrogate compound recovery limits have not been met.
B2	The sample matrix caused possible effects on measurement. The result may be biased high.
B1	The sample matrix caused possible effects on measurement. The result may be biased low.
ND	Analyte NOT DETECTED at or above the reporting limit
*	Non-NELAP accredited

SF40329-03 & SF40329-06: These two samples were a solid material, however, due to the composition of the samples, the laboratory could not perform the dry weight test. (For safety issues, the samples were not placed in an oven overnight.) Results will be reported on a wet weight basis.

Method 8260: Tentatively Identified Compounds (TICs) were detected in the volatile analysis of sample SF40329-11. Please contact the laboratory if additional information about the TICs is needed.

Method 8260: Due to the high concentration of analytes, matrix spikes and matrix spike duplicates were not analyzed for this method. Therefore, NELAC and method requirements were not all met.

Method 8260: Reporting limits were increased for samples due to the amount of diluting that was required to bring the high-level analytes into the detector's analytical range.

Metals: SF40329-01 Client Matrix Assessment- sample failed post spike test for Arsenic and Thallium, indicating probable matrix intereference.

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**		
Project/Facility Number:	0210600007	Date Received :	06/05/14
Funding Code:	LP41	Visit Number:	
Trip ID:		Temperature C:	11.0(

Metals: SF40329-03 Client Matrix Assessment- sample failed post spike test for Arsenic, Barium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Nickel, Sodium, Strontium, Vanadium, Antimony, and Thallium, indicating probable matrix intereference. Sample failed method dilution test for Calcium, Cadmium, Iron, Lead, Magnesium, and Manganese indicating probable matrix intereference.

Metals: SF40329-11 Client Matrix Assessment- sample failed post spike test for Arsenic, Chromium, Iron, and Zinc, indicating probable matrix intereference.

SF40329-11: Due to the oily nature of this sample, the pH test could not be performed.

Report Authorized by:

Matthew C. Neely
Organic Analysis Unit Supervisor

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08/04/14 08:50

Attachment J

Drum Logs and Photos

The following pages include data from field observations in the form of typed drum logs for wastes sampled in the Paint Shop hangar (0210600007) on June 5, 2014 and photos taken on June 5, 2014. The following photos were taken on June 5, 2014.

Southwest corner of north hangar (the Paint Shop) prior to sampling - Photo 0210600007~06052014-001 exterior view, 0210600007~06052014-002 interior view from just inside the west hangar door.

Interior of north hangar - photos 0210600007~06052014-003 and 004 show waste drums prior to marking drum numbers and sampling. The east sump is shown in photo 0210600007~06052014-005. The west sump being checked for wastes is shown in photo 0210600007~06052014-017. Photo 0210600007~06052014-006 shows drums marked and staged for sampling.

Drum F is shown in photos 0210600007~06052014-018. Sample X201 from drum F is shown in photos 0210600007~06052014-007 and 0210600007~06052014-030.

Drum G is shown in photos 0210600007~06052014-019. Sample X202 from drum G is shown in photos 0210600007~06052014-008 and 0210600007~06052014-030.

Drum H is shown in photos 0210600007~06052014-020. Samples X203 from drum H is shown in photos 0210600007~06052014-010 and 0210600007~06052014-030.

Drum I is shown in photos 0210600007~06052014-021. Sample X204 from drum I is shown in photos 0210600007~06052014-009 and 0210600007~06052014-030.

Drum J is shown in photos 0210600007~06052014-022. Sample X205 from drum J is shown in photos 0210600007~06052014-011 and 0210600007~06052014-030.

Drum P is shown in photos 0210600007~06052014-025. Sample X206 from drum P is shown in photos 0210600007~06052014-012 and 0210600007~06052014--030.

Drum R is shown in photos 0210600007~06052014-026. Sample X207 from drum R is shown in photos 0210600007~06052014-013 and 0210600007~06052014--030.

Drum S is shown in photos 0210600007~06052014-027. Sample X208 from drum S is shown in photos 0210600007~06052014-014 and 0210600007~06052014--030.

Drum T is shown in photos 0210600007~06052014-028. Sample X209 from drum T is shown in photos 0210600007~06052014-015 and 0210600007~06052014--030.

Drum V is shown in photos 0210600007~06052014-029. Sample X210 from drum V is shown in photos 0210600007~06052014-016 and 0210600007~06052014--030.

Bucket (B1) is shown in photos 0210600007~06052014-031. Sample X211 from bucket B1 is shown in photos 0210600007~06052014-030 and 0210600007~06052014--030.

ILLINOIS EPA DRUM LOG SHEET

_X_ 0210600007 – Christian County Taylorville/ The Paint Shop

__ 0210605081 – Christian County Taylorville/ Evergreen Aviation

Date June 5, 2014

Time 14:20

USEPA I.D. # ILD982621690

USEPA I.D. # --

Inspector S. Townsend

DRUM INFORMATION

DRUM # B1 (Metal Bucket)

DRUM SIZE (Gals.) 5 X 30 ___ 55 ___ Other ___

DRUM TYPE: Steel ___ Plastic ___ Fiber ___ Other X

Open Head X Bung ___ Open Head and Bung ___

DRUM COLOR Black and white with multi-colored paint splashes

DRUM CONDITION: Exc. ___ Good X Fair ___ Other ___

Open X Closed ___ Leaking ___

DRUM MARKINGS: "Flamable Liquid" on product label.

DRUM CONTENTS

VOLUME: Empty ___ 1/8 X 1/3 ___ 1/2 ___ 2/3 ___ 3/4 ___ Full

COLOR: Orange-Brown

PHYSICAL STATE: Solid X Semi-solid ___ Liquid X Layered X

ODOR: Empty ___ FIELD Ph: ___

SAMPLE INFO.

SAMPLE #: X211 (IEPA) SAMPLE JAR: Plastic ___ Glass X (2)

SAMPLE METHOD: Glass Tube ___ Trowel ___ Dip ___ Other X

COLLECTE BY: TSK, MW, ___, ___

ADDITIONAL COMMENTS: Emptied product container used during painting/clean-up. Liquid on top of solidified (plastic like) layer Duller yellowish green than other samples collected. Andrews sample number S11.

ILLINOIS EPA DRUM LOG SHEET

X 0210600007 - Christian County Taylorville/ The Paint Shop
__ 0210605081- Christian County Taylorville/ Evergreen Aviation
Date June 5, 2014
Time 12:04

USEPA I.D. # ILD982621690
USEPA I.D. # --
Inspector S. Townsend

DRUM INFORMATION

DRUM # F

DRUM SIZE (Gals.) 5 ____ 30 ____ 55 X Other ____

DRUM TYPE: Steel ____ Plastic X Fiber ____ Other ____

Open Head ____ Bung X Open Head and Bung ____

DRUM COLOR Blue

DRUM CONDITION: Exc. ____ Good X Fair ____ Other ____

Open ____ Closed X Leaking ____

DRUM MARKINGS: "Corrosive" Label on drum

DRUM CONTENTS

VOLUME: Empty ____ 1/8 ____ 1/3 ____ 1/2 ____ 2/3 ____ 3/4 ____ Full ____

COLOR: ____

PHYSICAL STATE: Solid ____ Semi-solid ____ Liquid X Layered ____

ODOR: Empty ____ FIELD Ph: 3

SAMPLE INFO.

SAMPLE #: X201 SAMPLE JAR: Plastic ____ Glass ____

SAMPLE METHOD: Glass Tube ____ Trowel ____ Dip ____ Other X

COLLECTE BY: TSK, MW, ____, ____

ADDITIONAL COMMENTS: Slightly Opaque - "Thief" used for sampling. Andrews sample number S1. Head Space PID = 56.2, FID = 1860

ILLINOIS EPA DRUM LOG SHEET

_X_ 0210600007 – Christian County Taylorville/ The Paint Shop

__ 0210605081 – Christian County Taylorville/ Evergreen Aviation

Date June 5, 2014

Time 12:12

USEPA I.D. # ILD982621690

USEPA I.D. # --

Inspector S. Townsend

DRUM INFORMATION

DRUM # 6

DRUM SIZE (Gals.) 5 ____ 30 ____ 55 X Other ____

DRUM TYPE: Steel ____ Plastic X Fiber ____ Other ____

Open Head ____ Bung X Open Head and Bung ____

DRUM COLOR Blue

DRUM CONDITION: Exc. ____ Good X Fair ____ Other ____

Open ____ .Closed X Leaking ____

DRUM MARKINGS: ____

DRUM CONTENTS

VOLUME: Empty ___ 1/8 ___ 1/3 ___ 1/2 ___ 2/3 ___ 3/4 ___ Full ___

COLOR: ____

PHYSICAL STATE: Solid ____ Semi-solid ____ Liquid X Layered ____

ODOR: Empty ____ FIELD Ph: 3

SAMPLE INFO.

SAMPLE #: X202 (IEPA) SAMPLE JAR: Plastic ____ Glass X (2)

SAMPLE METHOD: Glass Tube ___ Trowel ___ Dip ___ Other X

COLLECTE BY: TSK , MW ; ____ , ____ ,

ADDITIONAL COMMENTS: Slightly Opaque - "Thief" used for sampling. Andrews sample number S2. Head Space PID = 119, FID = 1186

ILLINOIS EPA DRUM LOG SHEET

_X_ 0210600007 – Christian County __ 0210605081 – Christian County Date June 5, 2014

Taylorville/ The Paint Shop Taylorville/ Evergreen Aviation Time 12:47

USEPA I.D. # ILD982621690 USEPA I.D. # - - Inspector S. Townsend

DRUM INFORMATION

DRUM # H

DRUM SIZE (Gals.) 5 ___ 30 ___ 55 _X_ Other ___

DRUM TYPE: Steel ___ Plastic _X_ Fiber ___ Other ___

Open Head ___ Bung ___ Open Head and Bung ___

DRUM COLOR Blue

DRUM CONDITION: Exc. ___ Good _X_ Fair ___ Other ___

Open ___ Closed _X_ Leaking ___

DRUM MARKINGS: ___

DRUM CONTENTS

VOLUME: Empty ___ 1/8 ___ 1/3 ___ 1/2 ___ 2/3 ___ 3/4 ___ Full _X_

COLOR: Grayish brown

PHYSICAL STATE: Solid ___ Semi-solid _X_ Liquid ___ Layered ___

ODOR: Empty ___ FIELD Ph: 4

SAMPLE INFO.

SAMPLE #: X203 (IEPA) SAMPLE JAR: Plastic ___ Glass X (2)

SAMPLE METHOD: Glass Tube ___ Trowel _X_ Dip ___ Other ___

COLLECTE BY: TSK, MW, ___, ___

ADDITIONAL COMMENTS: Solid chips + plastic bags. Theif did not work used plastic trowel. Paint sludge Andrews sample number S3. Head Space PID = 122, FID = 376

ILLINOIS EPA DRUM LOG SHEET

X 0210600007 – Christian County Taylorville/ The Paint Shop

__ 0210605081 – Christian County Taylorville/ Evergreen Aviation

Date June 5, 2014

Time 12:26

USEPA I.D. # ILD982621690

USEPA I.D. # --

Inspector S. Townsend

DRUM INFORMATION

DRUM # I

DRUM SIZE (Gals.) 5 ___ 30 ___ 55 X Other ___

DRUM TYPE: Steel ___ Plastic X Fiber ___ Other ___

Open Head ___ Bung X Open Head and Bung ___

DRUM COLOR Black with off white rusted lid. Greenish-tan drips on the sides.

DRUM CONDITION: Exc. ___ Good X Fair ___ Other ___

Open ___ Closed X Leaking ___

DRUM MARKINGS: "SLUDGE" "PAINT CHIPS" "PAPER" "PLASTIC"

DRUM CONTENTS

VOLUME: Empty ___ 1/8 ___ 1/3 ___ 1/2 ___ 2/3 ___ 3/4 ___ Full

COLOR: Yellow - green

PHYSICAL STATE: Solid ___ Semi-solid X Liquid ___ Layered ___

ODOR: Empty ___ FIELD Ph: 3

SAMPLE INFO.

SAMPLE #: X204 (IEPA) SAMPLE JAR: Plastic ___ Glass X (2)

SAMPLE METHOD: Glass Tube ___ Trowel ___ Dip ___ Other X

COLLECTE BY: TSK, MW, ___, ___,

ADDITIONAL COMMENTS: Opaque liquid. Used a "thief" for sampling. Andrews sample number S4. Head Space PID = 220, FID = 252

ILLINOIS EPA DRUM LOG SHEET

_X_ 0210600007 – Christian County Taylorville/ The Paint Shop   ___ 0210605081 – Christian County Taylorville/ Evergreen Aviation   Date _June 5, 2014_

Time _12:52_

USEPA I.D. # _ILD982621690_   USEPA I.D. # _- -_   Inspector _S. Townsend_

DRUM INFORMATION

DRUM # _J_

DRUM SIZE (Gals.) 5 ___ 30 ___ 55 _X_ Other ___

DRUM TYPE: Steel ___ Plastic _X_ Fiber ___ Other ___

Open Head ___ Bung ___ Open Head and Bung ___.

DRUM COLOR _Blue_

DRUM CONDITION: Exc. ___ Good _X_ Fair ___ Other ___

Open ___ Closed _X_ Leaking ___

DRUM MARKINGS: ___

DRUM CONTENTS

VOLUME: Empty ___ 1/8 ___ 1/3 ___ 1/2 ___ 2/3 ___ 3/4 ___ Full

COLOR: _Yellow_

PHYSICAL STATE: Solid ___ Semi-solid ___ Liquid _X_ Layered ___

ODOR: Empty ___ FIELD Ph: _3_

SAMPLE INFO.

SAMPLE #: _X205_   (IEPA) SAMPLE JAR: Plastic ___ Glass _X (2)_

SAMPLE METHOD: Glass Tube ___ Trowel ___ Dip ___ Other _X_

COLLECTE BY: _TSK_, _MW_, ___, ___,

ADDITIONAL COMMENTS: _Slightly opaque liquid with white "floaties". Used a "thief" for sampling. Andrews sample number S5. Head Space PID = 141, FID = 282_

ILLINOIS EPA DRUM LOG SHEET

_X_ 0210600007 – Christian County Taylorville/ The Paint Shop

__ 0210605081– Christian County Taylorville/ Evergreen Aviation

Date _June 5, 2014_

Time _13:14_

USEPA I.D. # _ILD982621690_

USEPA I.D. # _- -_

Inspector _S. Townsend_

DRUM INFORMATION

DRUM # _P_

DRUM SIZE (Gals.) 5 ____ 30 ____ 55 _X_ Other ____

DRUM TYPE: Steel _X_ Plastic ____ Fiber ____ Other ____

Open Head ____ Bung ____ Open Head and Bung _X_

DRUM COLOR _Black with off rusty white lid_

DRUM CONDITION: Exc. ____ Good _X_ Fair ____ Other ____

Open ____ .Closed _X_ Leaking ____

DRUM MARKINGS: _"PIT SLUDGE"_

DRUM CONTENTS

VOLUME: Empty ____ 1/8 ____ 1/3 ____ 1/2 ____ 2/3 ____ 3/4 ____ Full

COLOR: _Gray-Brown_

PHYSICAL STATE: Solid ____ Semi-solid ____ Liquid _X_ Layered ____

ODOR: Empty ____ FIELD Ph: _6_

SAMPLE INFO.

SAMPLE #: _X206_ (IEPA) SAMPLE JAR: Plastic ____ Glass _X (2)_

SAMPLE METHOD: Glass Tube ____ Trowel ____ Dip ____ Other _X_

COLLECTE BY: _TSK_, _MW_, ____, ____,

ADDITIONAL COMMENTS: _Liquid & solid layers. Michael Brandis ID'd as the same as drum "H" Used a "thief" for sampling . Andrews sample number S6. Head Space PID = 151, FID = 484_

ILLINOIS EPA DRUM LOG SHEET

_X_ 0210600007 – Christian County — Taylorville/ The Paint Shop
__ 0210605081 – Christian County — Taylorville/ Evergreen Aviation

Date _June 5, 2014_
Time _13:21_

USEPA I.D. # _ILD982621690_ USEPA I.D. # _- -_ Inspector _S. Townsend_

DRUM INFORMATION

DRUM # _R_

DRUM SIZE (Gals.) 5 ___ 30 ___ 55 _X_ Other ___

DRUM TYPE: Steel ___ Plastic _X_ Fiber ___ Other ___

Open Head ___ Bung _X_ Open Head and Bung ___

DRUM COLOR _Black_

DRUM CONDITION: Exc. ___ Good _X_ Fair ___ Other ___

Open ___ Closed _X_ Leaking ___

DRUM MARKINGS: _"PIT"_

DRUM CONTENTS

VOLUME: Empty ___ 1/8 ___ 1/3 ___ 1/2 ___ 2/3 ___ 3/4 ___ Full

COLOR: _Yellow_

PHYSICAL STATE: Solid ___ Semi-solid ___ Liquid _X_ Layered ___

ODOR: Empty ___ FIELD Ph: _5_

SAMPLE INFO.

SAMPLE #: _X207_ (IEPA) SAMPLE JAR: Plastic ___ Glass _X (2)_

SAMPLE METHOD: Glass Tube ___ Trowel ___ Dip ___ Other _X_

COLLECTE BY: _TSK_, _MW_, ___, ___

ADDITIONAL COMMENTS: _Opaque liquid. Andrews sample number S7 Head Space PID = 140, FID = 412_

ILLINOIS EPA DRUM LOG SHEET

_X_ 0210600007 - Christian County Taylorville/ The Paint Shop

__ 0210605081- Christian County Taylorville/ Evergreen Aviation

Date June 5, 2014

Time 13:34

USEPA I.D. # ILD982621690

USEPA I.D. # --

Inspector S. Townsend

DRUM INFORMATION

DRUM # 5

DRUM SIZE (Gals.) 5 ____ 30 ____ 55 _X_ Other ____

DRUM TYPE: Steel ____ Plastic _X_ Fiber ____ Other ____

Open Head ____ Bung _X_ Open Head and Bung ____

DRUM COLOR Black

DRUM CONDITION: Exc. ____ Good _X_ Fair ____ Other ____

Open ____ Closed _X_ Leaking ____

DRUM MARKINGS: "E & I Rinse"

DRUM CONTENTS

VOLUME: Empty ____ 1/8 ____ 1/3 ____ 1/2 ____ 2/3 ____ 3/4 ____ Full

COLOR: Yellow -Green

PHYSICAL STATE: Solid ____ Semi-solid ____ Liquid _X_ Layered ____

ODOR: Empty ____ FIELD Ph: 5

SAMPLE INFO.

SAMPLE #: X208 (IEPA) SAMPLE JAR: Plastic ____ Glass _X (2)_

SAMPLE METHOD: Glass Tube ____ Trowel ____ Dip ____ Other _X_

COLLECTE BY: TSK, MW, ____, ____

ADDITIONAL COMMENTS: Liquid. Duller yellowish green than other samples collected. Andrews sample number S8 Head Space PID = 4.28, FID = 128

ILLINOIS EPA DRUM LOG SHEET

X 0210600007 – Christian County Taylorville/ The Paint Shop | ___ 0210605081 – Christian County Taylorville/ Evergreen Aviation | Date June 5, 2014 Time 13:42

USEPA I.D. # ILD982621690 | USEPA I.D. # - - | Inspector S. Townsend

DRUM INFORMATION

DRUM # T

DRUM SIZE (Gals.) 5 ___ 30 ___ 55 X Other ___

DRUM TYPE: Steel ___ Plastic X Fiber ___ Other ___

Open Head ___ Bung X Open Head and Bung ___

DRUM COLOR Blue

DRUM CONDITION: Exc. ___ Good X Fair ___ Other ___

Open ___ Closed X Leaking ___

DRUM MARKINGS: I & E Rinse

DRUM CONTENTS

VOLUME: Empty ___ 1/8 ___ 1/3 ___ 1/2 ___ 2/3 ___ 3/4 ___ Full

COLOR: Green-Yellow

PHYSICAL STATE: Solid ___ Semi-solid ___ Liquid X Layered ___

ODOR: Empty ___ FIELD Ph: 5

SAMPLE INFO.

SAMPLE #: X209 (IEPA) SAMPLE JAR: Plastic ___ Glass X (2)

SAMPLE METHOD: Glass Tube ___ Trowel ___ Dip ___ Other X

COLLECTE BY: TSK, MW, ___, ___,

ADDITIONAL COMMENTS: Resembles "Mountain Dew" Liquid. Andrews sample number S9 Head Space PID = 77.6, FID = 172.

ILLINOIS EPA DRUM LOG SHEET

X 0210600007 - Christian County Taylorville/ The Paint Shop

__ 0210605081- Christian County Taylorville/ Evergreen Aviation

Date June 5, 2014

Time 13:50

USEPA I.D. # ILD982621690

USEPA I.D. # - -

Inspector S. Townsend

DRUM INFORMATION

DRUM # V

DRUM SIZE (Gals.) 5 ____ 30 ____ 55 X Other ____

DRUM TYPE: Steel ____ Plastic X Fiber ____ Other ____

Open Head ____ Bung X Open Head and Bung ____

DRUM COLOR Black

DRUM CONDITION: Exc. ____ Good X Fair ____ Other ____

Open ____ Closed X Leaking ____

DRUM MARKINGS: "Outside drums" and "Pit Water"

DRUM CONTENTS

VOLUME: Empty ____ 1/8 ____ 1/3 ____ 1/2 ____ 2/3 ____ 3/4 ____ Full

COLOR: Yellow -Green

PHYSICAL STATE: Solid ____ Semi-solid ____ Liquid X Layered ____

ODOR: Empty ____ FIELD Ph: 4

SAMPLE INFO.

SAMPLE #: X210 (IEPA) SAMPLE JAR: Plastic ____ Glass X (2)

SAMPLE METHOD: Glass Tube ____ Trowel ____ Dip ____ Other X

COLLECTE BY: TSK, MW, ____, ____

ADDITIONAL COMMENTS: Liquid. Duller yellowish green than other samples collected. Andrews sample number S10 Head Space PID = 47.1, FID = 488

Townsend, Steve

To: Townsend, Steve
Subject: FW: Laboratory Data and Tables
Attachments: Brandis Data Table 060514.pdf; 14060413R.pdf

0210600007 – Christian County
Taylorville/The Paint Shop
ILD982621690
FOS FILE

0210605081 – Christian County
Taylorville/Evergreen Aviation
FOS FILE

ATTACHMENT K

From: Eisenbrandt, Paul
Sent: Monday, August 11, 2014 1:37 PM
To: Townsend, Steve; Jansen, David
Subject: FW: Laboratory Data and Tables

FYI

From: Kenn Liss [mailto:kliss@andrews-eng.com]
Sent: Monday, August 11, 2014 1:34 PM
To: Eisenbrandt, Paul
Cc: Stephen F. Hedinger
Subject: FW: Laboratory Data and Tables

Paul:

I have attached the data tables summarizing the sampling conducted at the Brandis facility in Taylorville, IL. Also attached is the actual lab report. If you have any questions please contact me or Steve Hedinger.
Sincerely,

Kenneth W. Liss LPG
President
Andrews Engineering, Inc.
(217) 787-2334

Teklab Inc.
Environmental Laboratory

http://www.teklabinc.com/

June 16, 2014

Kim Van Pelt
Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711-7233
TEL: (217) 787-2334
FAX: (217) 787-9495

NELAP ACCREDITED TNI LABORATORY

RE: Brandis Aircraft RCRA

WorkOrder: 14060413

Dear Kim Van Pelt:

TEKLAB, INC received 11 samples on 6/6/2014 3:20:00 PM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Shelly A Hennessy

Shelly A. Hennessy
Project Manager
(618)344-1004 ex 36
SHennessy@teklabinc.com

Teklab Inc
Environmental Laboratory

Definitions

http://www.teklabinc.com/

Client: Andrews Engineering, Inc. **Work Order:** 14060413

Client Project: Brandis Aircraft RCRA **Report Date:** 16-Jun-14

Abbr Definition

Abbr	Definition
CCV	Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
DF	Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilutions factors.
DNI	Did not ignite
DUP	Laboratory duplicate is an aliquot of a sample taken from the same container under laboratory conditions for independent processing and analysis independently of the original aliquot.
ICV	Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
IDPH	IL Dept. of Public Health
LCS	Laboratory control sample, spiked with verified known amounts of analytes, is analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. The acceptable recovery range is in the QC Package (provided upon request).
LCSD	Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MB	Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
MDL	Method detection limit means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.
MS	Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
MSD	Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MW	Molecular weight
ND	Not Detected at the Reporting Limit
NELAP	NELAP Accredited
PQL	Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions. The acceptable recovery range is listed in the QC Package (provided upon request).
RL	The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
RPD	Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
SPK	The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
Surr	Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
TNTC	Too numerous to count (> 200 CFU)

Qualifiers

# -	Unknown hydrocarbon	B -	Analyte detected in associated Method Blank
E -	Value above quantitation range	H -	Holding times exceeded
J -	Analyte detected below quantitation limits	M -	Manual Integration used to determine area response
ND -	Not Detected at the Reporting Limit	R -	RPD outside accepted recovery limits
S -	Spike Recovery outside recovery limits	X -	Value exceeds Maximum Contaminant Level

Teklab Inc
Environmental Laboratory

Case Narrative

http://www.teklabinc.com/

Client: Andrews Engineering, Inc. **Work Order:** 14060413

Client Project: Brandis Aircraft RCRA **Report Date:** 16-Jun-14

Cooler Receipt Temp: 0.6 °C

This report was revised on June 16, 2014 per Kim Van Pelt's request to include methylene chloride on the VOC list. Please replace report dated June 12, 2014 with this report. SAH 6/16/14

Locations and Accreditations

	Collinsville	Springfield	Kansas City	Collinsville Air
Address	5445 Horseshoe Lake Road Collinsville, IL 62234-7425	3920 Pintail Dr Springfield, IL 62711-9415	8421 Nieman Road Lenexa, KS 66214	5445 Horseshoe Lake Road Collinsville, IL 62234-7425
Phone	(618) 344-1004	(217) 698-1004	(913) 541-1998	(618) 344-1004
Fax	(618) 344-1005	(217) 698-1005	(913) 541-1998	(618) 344-1005
Email	jhriley@teklabinc.com	KKlostermann@teklabinc.com	dthompson@teklabinc.com	EHurley@teklabinc.com

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2015	Collinsville
Kansas	KDHE	E-10374	NELAP	4/30/2015	Collinsville
Louisiana	LDEQ	166493	NELAP	6/30/2014	Collinsville
Louisiana	LDEQ	166578	NELAP	6/30/2014	Collinsville
Texas	TCEQ	T104704515-12-1	NELAP	7/31/2014	Collinsville
Arkansas	ADEQ	88-0966		3/14/2015	Collinsville
Illinois	IDPH	17584		5/31/2015	Collinsville
Kentucky	UST	0073		1/31/2015	Collinsville
Missouri	MDNR	00930		5/31/2015	Collinsville
Oklahoma	ODEQ	9978		8/31/2014	Collinsville

Teklab, Inc. Environmental Laboratory

Laboratory Results

http://www.teklabinc.com/

Client: Andrews Engineering, Inc.
Work Order: 14060413
Client Project: Brandis Aircraft RCRA
Report Date: 16-Jun-14
Lab ID: 14060413-001
Client Sample ID: S-1
Matrix: AQUEOUS
Collection Date: 06/05/2014 12:04

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 1020B								
Ignitability, Closed Cup		60		**>200**	°F	1	06/09/2014 10:40	R191670
SW-846 7196A								
Chromium, Hexavalent	NELAP	0.025	SH	**< 0.025**	mg/L	5	06/06/2014 17:26	R191651
Results verified by dilution.								
MS did not recover within control limits due to matrix interference.								
Elevated reporting limit due to matrix interference.								
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1	E	**3.05**		1	06/09/2014 15:08	R191698
Results are estimated due to sample result being outside the calibration range.								
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Aluminum	NELAP	5		**24.2**	mg/L	100	06/09/2014 18:09	99500
Arsenic	NELAP	0.025		**< 0.025**	mg/L	1	06/10/2014 10:33	99500
Barium	NELAP	0.005		**0.269**	mg/L	1	06/10/2014 10:33	99500
Cadmium	NELAP	0.2		**4.15**	mg/L	100	06/09/2014 18:09	99500
Chromium	NELAP	1		**11.6**	mg/L	100	06/09/2014 18:09	99500
Lead	NELAP	0.04		**0.182**	mg/L	1	06/10/2014 10:33	99500
Selenium	NELAP	0.05		**< 0.05**	mg/L	1	06/10/2014 10:33	99500
Silver	NELAP	0.01		**< 0.01**	mg/L	1	06/10/2014 10:33	99500
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.0002		**< 0.0002**	mg/L	1	06/10/2014 10:42	99505
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
1,1-Dichloroethene	NELAP	2500000		**ND**	µg/L	5E+05	06/10/2014 19:33	99589
1,2-Dichloroethane	NELAP	2500000		**ND**	µg/L	5E+05	06/10/2014 19:33	99589
2-Butanone	NELAP	12500000		**ND**	µg/L	5E+05	06/10/2014 19:33	99589
Benzene	NELAP	1000000		**ND**	µg/L	5E+05	06/10/2014 19:33	99589
Carbon tetrachloride	NELAP	2500000		**ND**	µg/L	5E+05	06/10/2014 19:33	99589
Chlorobenzene	NELAP	2500000		**ND**	µg/L	5E+05	06/10/2014 19:33	99589
Chloroform	NELAP	2500000		**ND**	µg/L	5E+05	06/10/2014 19:33	99589
Methylene chloride	NELAP	2500000		**15200000**	µg/L	5E+05	06/10/2014 19:33	99589
Tetrachloroethene	NELAP	2500000		**ND**	µg/L	5E+05	06/10/2014 19:33	99589
Trichloroethene	NELAP	2500000		**ND**	µg/L	5E+05	06/10/2014 19:33	99589
Vinyl chloride	NELAP	1000000		**ND**	µg/L	5E+05	06/10/2014 19:33	99589
Surr: 1,2-Dichloroethane-d4		74.7-129		**102.3**	%REC	5E+05	06/10/2014 19:33	99589
Surr: 4-Bromofluorobenzene		86-119		**101.3**	%REC	5E+05	06/10/2014 19:33	99589
Surr: Dibromofluoromethane		81.7-123		**100.1**	%REC	5E+05	06/10/2014 19:33	99589
Surr: Toluene-d8		84.3-114		**100.5**	%REC	5E+05	06/10/2014 19:33	99589
Elevated reporting limit due to high levels of target and/or non-target analytes.								

Teklab Inc. Environmental Laboratory

Laboratory Results

http://www.teklabinc.com/

Client: Andrews Engineering, Inc.
Work Order: 14060413
Client Project: Brandis Aircraft RCRA
Report Date: 16-Jun-14
Lab ID: 14060413-002
Client Sample ID: S-2
Matrix: AQUEOUS
Collection Date: 06/05/2014 12:12

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 1020B								
Ignitability, Closed Cup		60		>200	°F	1	06/09/2014 10:58	R191670
SW-846 7196A								
Chromium, Hexavalent	NELAP	0.025	SH	< 0.025	mg/L	5	06/06/2014 17:28	R191651
Results verified by dilution.								
MS did not recover within control limits due to matrix interference.								
Elevated reporting limit due to matrix interference.								
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1	E	3.1		1	06/09/2014 15:09	R191698
Results are estimated due to sample result being outside the calibration range.								
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Aluminum	NELAP	5		15.6	mg/L	100	06/09/2014 18:15	99500
Arsenic	NELAP	0.025		< 0.025	mg/L	1	06/10/2014 10:39	99500
Barium	NELAP	0.005		0.279	mg/L	1	06/10/2014 10:39	99500
Cadmium	NELAP	0.2		6.54	mg/L	100	06/09/2014 18:15	99500
Chromium	NELAP	1		12.2	mg/L	100	06/09/2014 18:15	99500
Lead	NELAP	0.04		0.134	mg/L	1	06/10/2014 10:39	99500
Selenium	NELAP	0.05		< 0.05	mg/L	1	06/10/2014 10:39	99500
Silver	NELAP	0.01		< 0.01	mg/L	1	06/10/2014 10:39	99500
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.0002		< 0.0002	mg/L	1	06/10/2014 10:44	99505
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
1,1-Dichloroethene	NELAP	2500000		ND	µg/L	5E+05	06/10/2014 23:08	99589
1,2-Dichloroethane	NELAP	2500000		ND	µg/L	5E+05	06/10/2014 23:08	99589
2-Butanone	NELAP	12500000		ND	µg/L	5E+05	06/10/2014 23:08	99589
Benzene	NELAP	1000000		ND	µg/L	5E+05	06/10/2014 23:08	99589
Carbon tetrachloride	NELAP	2500000		ND	µg/L	5E+05	06/10/2014 23:08	99589
Chlorobenzene	NELAP	2500000		ND	µg/L	5E+05	06/10/2014 23:08	99589
Chloroform	NELAP	2500000		ND	µg/L	5E+05	06/10/2014 23:08	99589
Methylene chloride	NELAP	2500000		14100000	µg/L	5E+05	06/10/2014 23:08	99589
Tetrachloroethene	NELAP	2500000		ND	µg/L	5E+05	06/10/2014 23:08	99589
Trichloroethene	NELAP	2500000		ND	µg/L	5E+05	06/10/2014 23:08	99589
Vinyl chloride	NELAP	1000000		ND	µg/L	5E+05	06/10/2014 23:08	99589
Surr: 1,2-Dichloroethane-d4		74.7-129		103.3	%REC	5E+05	06/10/2014 23:08	99589
Surr: 4-Bromofluorobenzene		86-119		101.3	%REC	5E+05	06/10/2014 23:08	99589
Surr: Dibromofluoromethane		81.7-123		101.7	%REC	5E+05	06/10/2014 23:08	99589
Surr: Toluene-d8		84.3-114		100.8	%REC	5E+05	06/10/2014 23:08	99589
Elevated reporting limit due to high levels of target and/or non-target analytes.								

Teklab Inc.
Environmental Laboratory

Laboratory Results

http://www.teklabinc.com/

Client: Andrews Engineering, Inc.
Work Order: 14060413
Client Project: Brandis Aircraft RCRA
Report Date: 16-Jun-14
Lab ID: 14060413-003
Client Sample ID: S-3
Matrix: SOLID
Collection Date: 06/05/2014 12:47

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D92								
Ignitability, Open Cup		60		**>200**	°F	1	06/10/2014 8:56	R191700
EPA SW846 3550C, 5035A, ASTM D2974								
Percent Moisture		0.1		**45**	%	1	06/09/2014 15:32	R191717
SW-846 7196A								
Chromium, Hexavalent	NELAP	346		**< 346**	mg/Kg-dry	1000	06/10/2014 12:42	99554
Elevated reporting limit due to sample composition.								
SW-846 9045C								
pH (1:1)	NELAP	1		**3.98**		1	06/12/2014 9:55	R191862
Results are estimated due to sample result being outside the calibration range.								
SW-846 3050B, 6010B, METALS BY ICP								
Aluminum	NELAP	5		**12100**	mg/Kg-dry	1	06/11/2014 18:53	99538
Arsenic	NELAP	2.5		**< 2.5**	mg/Kg-dry	1	06/11/2014 18:53	99538
Barium	NELAP	5		**1370**	mg/Kg-dry	10	06/12/2014 10:20	99538
Cadmium	NELAP	0.2		**70.5**	mg/Kg-dry	1	06/11/2014 18:53	99538
Chromium	NELAP	1		**2840**	mg/Kg-dry	1	06/11/2014 18:53	99538
Lead	NELAP	4		**1250**	mg/Kg-dry	1	06/11/2014 18:53	99538
Selenium	NELAP	4		**< 4**	mg/Kg-dry	1	06/11/2014 18:53	99538
Silver	NELAP	0.55		**0.57**	mg/Kg-dry	1	06/11/2014 18:53	99538
SW-846 7471B								
Mercury	NELAP	0.018	J	**0.006**	mg/Kg-dry	1	06/11/2014 9:54	99577
SW-846 5035, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
1,1-Dichloroethene	NELAP	217000		**ND**	µg/Kg-dry	10000	06/10/2014 11:48	99559
1,2-Dichloroethane	NELAP	217000		**ND**	µg/Kg-dry	10000	06/10/2014 11:48	99559
2-Butanone	NELAP	2170000		**ND**	µg/Kg-dry	10000	06/10/2014 11:48	99559
Benzene	NELAP	43300		**ND**	µg/Kg-dry	10000	06/10/2014 11:48	99559
Carbon tetrachloride	NELAP	217000		**ND**	µg/Kg-dry	10000	06/10/2014 11:48	99559
Chlorobenzene	NELAP	217000		**ND**	µg/Kg-dry	10000	06/10/2014 11:48	99559
Chloroform	NELAP	217000		**ND**	µg/Kg-dry	10000	06/10/2014 11:48	99559
Methylene chloride	NELAP	217000		**5450000**	µg/Kg-dry	10000	06/10/2014 11:48	99559
Tetrachloroethene	NELAP	217000		**ND**	µg/Kg-dry	10000	06/10/2014 11:48	99559
Trichloroethene	NELAP	217000		**ND**	µg/Kg-dry	10000	06/10/2014 11:48	99559
Vinyl chloride	NELAP	86600		**ND**	µg/Kg-dry	10000	06/10/2014 11:48	99559
Surr: 1,2-Dichloroethane-d4		72.2-131		**96.3**	%REC	10000	06/10/2014 11:48	99559
Surr: 4-Bromofluorobenzene		82.1-116		**100.8**	%REC	10000	06/10/2014 11:48	99559
Surr: Dibromofluoromethane		77.7-120		**99.7**	%REC	10000	06/10/2014 11:48	99559
Surr: Toluene-d8		86-116		**101.9**	%REC	10000	06/10/2014 11:48	99559
Elevated reporting limit due to high levels of target and/or non-target analytes.								

Teklab Inc. Environmental Laboratory

Laboratory Results

http://www.teklabinc.com/

Client: Andrews Engineering, Inc. **Work Order:** 14060413

Client Project: Brandis Aircraft RCRA **Report Date:** 16-Jun-14

Lab ID: 14060413-004 **Client Sample ID:** S-4

Matrix: AQUEOUS **Collection Date:** 06/05/2014 12:26

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 1020B								
Ignitability, Closed Cup		60		>200	°F	1	06/09/2014 12:50	R191670
SW-846 7196A								
Chromium, Hexavalent	NELAP	25	H	25	mg/L	5000	06/06/2014 18:16	R191651
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1	E	3.45		1	06/09/2014 15:10	R191698
Results are estimated due to sample result being outside the calibration range.								
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Aluminum	NELAP	5		11	mg/L	100	06/09/2014 18:21	99500
Arsenic	NELAP	0.025		< 0.025	mg/L	1	06/10/2014 10:45	99500
Barium	NELAP	0.005		0.473	mg/L	1	06/10/2014 10:45	99500
Cadmium	NELAP	0.2		2.41	mg/L	100	06/09/2014 18:21	99500
Chromium	NELAP	1		34.5	mg/L	100	06/09/2014 18:21	99500
Lead	NELAP	0.04		0.0745	mg/L	1	06/10/2014 10:45	99500
Selenium	NELAP	0.05		< 0.05	mg/L	1	06/10/2014 10:45	99500
Silver	NELAP	0.01		< 0.01	mg/L	1	06/10/2014 10:45	99500
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.0002		< 0.0002	mg/L	1	06/10/2014 10:46	99505
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
1,1-Dichloroethene	NELAP	25000		ND	µg/L	5000	06/11/2014 17:07	99633
1,2-Dichloroethane	NELAP	25000		ND	µg/L	5000	06/11/2014 17:07	99633
2-Butanone	NELAP	125000		177000	µg/L	5000	06/11/2014 17:07	99633
Benzene	NELAP	10000		ND	µg/L	5000	06/11/2014 17:07	99633
Carbon tetrachloride	NELAP	25000		ND	µg/L	5000	06/11/2014 17:07	99633
Chlorobenzene	NELAP	25000		ND	µg/L	5000	06/11/2014 17:07	99633
Chloroform	NELAP	25000		ND	µg/L	5000	06/11/2014 17:07	99633
Methylene chloride	NELAP	25000		642000	µg/L	5000	06/11/2014 17:07	99633
Tetrachloroethene	NELAP	25000		ND	µg/L	5000	06/11/2014 17:07	99633
Trichloroethene	NELAP	25000		ND	µg/L	5000	06/11/2014 17:07	99633
Vinyl chloride	NELAP	10000		ND	µg/L	5000	06/11/2014 17:07	99633
Surr: 1,2-Dichloroethane-d4		74.7-129		103.1	%REC	5000	06/11/2014 17:07	99633
Surr: 4-Bromofluorobenzene		86-119		103.4	%REC	5000	06/11/2014 17:07	99633
Surr: Dibromofluoromethane		81.7-123		101.4	%REC	5000	06/11/2014 17:07	99633
Surr: Toluene-d8		84.3-114		103.1	%REC	5000	06/11/2014 17:07	99633
Elevated reporting limit due to high levels of target and/or non-target analytes.								

Teklab, Inc.
Environmental Laboratory

Laboratory Results

http://www.teklabinc.com/

Client: Andrews Engineering, Inc. **Work Order:** 14060413
Client Project: Brandis Aircraft RCRA **Report Date:** 16-Jun-14
Lab ID: 14060413-005 **Client Sample ID:** S-5
Matrix: AQUEOUS **Collection Date:** 06/05/2014 12:52

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 1020B								
Ignitability, Closed Cup		60		**>200**	°F	1	06/09/2014 12:50	R191670
SW-846 7196A								
Chromium, Hexavalent	NELAP	0.1	H	**0.5**	mg/L	20	06/06/2014 18:17	R191651
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1	E	**3.15**		1	06/09/2014 15:12	R191698
Results are estimated due to sample result being outside the calibration range.								
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Aluminum	NELAP	5		**16.3**	mg/L	100	06/09/2014 18:27	99500
Arsenic	NELAP	0.025		**< 0.025**	mg/L	1	06/10/2014 10:51	99500
Barium	NELAP	0.005		**0.636**	mg/L	1	06/10/2014 10:51	99500
Cadmium	NELAP	0.2		**1.93**	mg/L	100	06/09/2014 18:27	99500
Chromium	NELAP	1		**16.2**	mg/L	100	06/09/2014 18:27	99500
Lead	NELAP	0.04		**0.134**	mg/L	1	06/10/2014 10:51	99500
Selenium	NELAP	0.05		**< 0.05**	mg/L	1	06/10/2014 10:51	99500
Silver	NELAP	0.01		**< 0.01**	mg/L	1	06/10/2014 10:51	99500
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.0002	S	**< 0.0002**	mg/L	1	06/10/2014 10:48	99505
Matrix interference present in sample. Confirmed by bench spike.								
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
1,1-Dichloroethene	NELAP	25000		**ND**	µg/L	5000	06/11/2014 17:34	99633
1,2-Dichloroethane	NELAP	25000		**ND**	µg/L	5000	06/11/2014 17:34	99633
2-Butanone	NELAP	125000	J	**31000**	µg/L	5000	06/11/2014 17:34	99633
Benzene	NELAP	10000		**ND**	µg/L	5000	06/11/2014 17:34	99633
Carbon tetrachloride	NELAP	25000		**ND**	µg/L	5000	06/11/2014 17:34	99633
Chlorobenzene	NELAP	25000		**ND**	µg/L	5000	06/11/2014 17:34	99633
Chloroform	NELAP	25000		**ND**	µg/L	5000	06/11/2014 17:34	99633
Methylene chloride	NELAP	250000		**5130000**	µg/L	50000	06/13/2014 13:37	99711
Tetrachloroethene	NELAP	25000		**ND**	µg/L	5000	06/11/2014 17:34	99633
Trichloroethene	NELAP	25000		**ND**	µg/L	5000	06/11/2014 17:34	99633
Vinyl chloride	NELAP	10000		**ND**	µg/L	5000	06/11/2014 17:34	99633
Surr: 1,2-Dichloroethane-d4		74.7-129		**102.7**	%REC	5000	06/11/2014 17:34	99633
Surr: 4-Bromofluorobenzene		86-119		**102.2**	%REC	5000	06/11/2014 17:34	99633
Surr: Dibromofluoromethane		81.7-123		**101.6**	%REC	5000	06/11/2014 17:34	99633
Surr: Toluene-d8		84.3-114		**102.6**	%REC	5000	06/11/2014 17:34	99633
Elevated reporting limit due to high levels of target and/or non-target analytes.								

Teklab Inc. Environmental Laboratory

Laboratory Results

http://www.teklabinc.com/

Client: Andrews Engineering, Inc. **Work Order:** 14060413

Client Project: Brandis Aircraft RCRA **Report Date:** 16-Jun-14

Lab ID: 14060413-006 **Client Sample ID:** S-6

Matrix: SOLID **Collection Date:** 06/05/2014 13:14

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D92								
Ignitability, Open Cup		60		**>200**	°F	1	06/10/2014 9:08	R191700
EPA SW846 3550C, 5035A, ASTM D2974								
Percent Moisture		0.1		**63.4**	%	1	06/09/2014 15:32	R191717
SW-846 7196A								
Chromium, Hexavalent	NELAP	530		**< 530**	mg/Kg-dry	1000	06/10/2014 12:44	99554
Elevated reporting limit due to sample composition.								
SW-846 9045C								
pH (1:1)	NELAP	1		**5.56**		1	06/12/2014 9:55	R191862
SW-846 3050B, 6010B, METALS BY ICP								
Aluminum	NELAP	4.55		**12000**	mg/Kg-dry	1	06/11/2014 18:57	99538
Arsenic	NELAP	2.27	J	**1.4**	mg/Kg-dry	1	06/11/2014 18:57	99538
Barium	NELAP	4.55		**1110**	mg/Kg-dry	10	06/12/2014 10:24	99538
Cadmium	NELAP	0.18		**149**	mg/Kg-dry	1	06/11/2014 18:57	99538
Chromium	NELAP	0.91		**2580**	mg/Kg-dry	1	06/11/2014 18:57	99538
Lead	NELAP	3.64		**511**	mg/Kg-dry	1	06/11/2014 18:57	99538
Selenium	NELAP	3.64		**< 3.64**	mg/Kg-dry	1	06/11/2014 18:57	99538
Silver	NELAP	0.5		**0.75**	mg/Kg-dry	1	06/11/2014 18:57	99538
SW-846 7471B								
Mercury	NELAP	0.026	J	**0.01**	mg/Kg-dry	1	06/11/2014 9:56	99577
SW-846 5035, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
1,1-Dichloroethene	NELAP	79500		**ND**	µg/Kg-dry	2000	06/10/2014 12:15	99559
1,2-Dichloroethane	NELAP	79500		**ND**	µg/Kg-dry	2000	06/10/2014 12:15	99559
2-Butanone	NELAP	795000		**ND**	µg/Kg-dry	2000	06/10/2014 12:15	99559
Benzene	NELAP	15900		**ND**	µg/Kg-dry	2000	06/10/2014 12:15	99559
Carbon tetrachloride	NELAP	79500		**ND**	µg/Kg-dry	2000	06/10/2014 12:15	99559
Chlorobenzene	NELAP	79500		**ND**	µg/Kg-dry	2000	06/10/2014 12:15	99559
Chloroform	NELAP	79500		**ND**	µg/Kg-dry	2000	06/10/2014 12:15	99559
Methylene chloride	NELAP	79500		**607000**	µg/Kg-dry	2000	06/10/2014 12:15	99559
Tetrachloroethene	NELAP	79500	J	**25000**	µg/Kg-dry	2000	06/10/2014 12:15	99559
Trichloroethene	NELAP	79500	J	**19000**	µg/Kg-dry	2000	06/10/2014 12:15	99559
Vinyl chloride	NELAP	31800		**ND**	µg/Kg-dry	2000	06/10/2014 12:15	99559
Surr: 1,2-Dichloroethane-d4		72.2-131		**96.2**	%REC	2000	06/10/2014 12:15	99559
Surr: 4-Bromofluorobenzene		82.1-116		**101.2**	%REC	2000	06/10/2014 12:15	99559
Surr: Dibromofluoromethane		77.7-120		**99.3**	%REC	2000	06/10/2014 12:15	99559
Surr: Toluene-d8		86-116		**102.8**	%REC	2000	06/10/2014 12:15	99559
Elevated reporting limit due to high levels of target and/or non-target analytes.								

Teklab, Inc. Environmental Laboratory

Laboratory Results

http://www.teklabinc.com/

Client: Andrews Engineering, Inc. **Work Order:** 14060413
Client Project: Brandis Aircraft RCRA **Report Date:** 16-Jun-14
Lab ID: 14060413-007 **Client Sample ID:** S-7
Matrix: AQUEOUS **Collection Date:** 06/05/2014 13:22

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 1020B								
Ignitability, Closed Cup		60		**>200**	°F	1	06/09/2014 12:50	R191670
SW-846 7196A								
Chromium, Hexavalent	NELAP	5	H	**9**	mg/L	1000	06/06/2014 18:09	R191651
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1		**4.1**		1	06/09/2014 15:13	R191698
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Aluminum	NELAP	5		**17.1**	mg/L	100	06/09/2014 18:33	99500
Arsenic	NELAP	0.025		**< 0.025**	mg/L	1	06/10/2014 10:57	99500
Barium	NELAP	0.005		**0.611**	mg/L	1	06/10/2014 10:57	99500
Cadmium	NELAP	0.2		**8.11**	mg/L	100	06/09/2014 18:33	99500
Chromium	NELAP	1		**23.6**	mg/L	100	06/09/2014 18:33	99500
Lead	NELAP	0.04		**0.2**	mg/L	1	06/10/2014 10:57	99500
Selenium	NELAP	0.05		**< 0.05**	mg/L	1	06/10/2014 10:57	99500
Silver	NELAP	0.01		**< 0.01**	mg/L	1	06/10/2014 10:57	99500
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.0002		**< 0.0002**	mg/L	1	06/10/2014 11:00	99505
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
1,1-Dichloroethene	NELAP	25000		**ND**	µg/L	5000	06/11/2014 18:01	99633
1,2-Dichloroethane	NELAP	25000		**ND**	µg/L	5000	06/11/2014 18:01	99633
2-Butanone	NELAP	125000	J	**51000**	µg/L	5000	06/11/2014 18:01	99633
Benzene	NELAP	10000		**ND**	µg/L	5000	06/11/2014 18:01	99633
Carbon tetrachloride	NELAP	25000		**ND**	µg/L	5000	06/11/2014 18:01	99633
Chlorobenzene	NELAP	25000		**ND**	µg/L	5000	06/11/2014 18:01	99633
Chloroform	NELAP	25000		**ND**	µg/L	5000	06/11/2014 18:01	99633
Methylene chloride	NELAP	25000		**728000**	µg/L	5000	06/11/2014 18:01	99633
Tetrachloroethene	NELAP	25000		**ND**	µg/L	5000	06/11/2014 18:01	99633
Trichloroethene	NELAP	25000		**ND**	µg/L	5000	06/11/2014 18:01	99633
Vinyl chloride	NELAP	10000		**ND**	µg/L	5000	06/11/2014 18:01	99633
Surr: 1,2-Dichloroethane-d4		74.7-129		**103.5**	%REC	5000	06/11/2014 18:01	99633
Surr: 4-Bromofluorobenzene		86-119		**102.6**	%REC	5000	06/11/2014 18:01	99633
Surr: Dibromofluoromethane		81.7-123		**101.8**	%REC	5000	06/11/2014 18:01	99633
Surr: Toluene-d8		84.3-114		**102.5**	%REC	5000	06/11/2014 18:01	99633

Elevated reporting limit due to high levels of target and/or non-target analytes.

Teklab Inc. Environmental Laboratory

Laboratory Results

http://www.teklabinc.com/

Client: Andrews Engineering, Inc. **Work Order:** 14060413

Client Project: Brandis Aircraft RCRA **Report Date:** 16-Jun-14

Lab ID: 14060413-008 **Client Sample ID:** S-8

Matrix: AQUEOUS **Collection Date:** 06/05/2014 13:34

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 1020B								
Ignitability, Closed Cup		60		**>200**	°F	1	06/09/2014 12:50	R191670
SW-846 7196A								
Chromium, Hexavalent	NELAP	5	H	**23**	mg/L	1000	06/06/2014 18:10	R191651
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1		**4.33**		1	06/09/2014 15:14	R191698
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Aluminum	NELAP	5		**23.9**	mg/L	100	06/09/2014 18:39	99500
Arsenic	NELAP	0.025		**< 0.025**	mg/L	1	06/10/2014 11:03	99500
Barium	NELAP	0.005		**0.206**	mg/L	1	06/10/2014 11:03	99500
Cadmium	NELAP	0.2		**9.77**	mg/L	100	06/09/2014 18:39	99500
Chromium	NELAP	1		**23.4**	mg/L	100	06/09/2014 18:39	99500
Lead	NELAP	0.04	J	**0.024**	mg/L	1	06/10/2014 11:03	99500
Selenium	NELAP	0.05		**< 0.05**	mg/L	1	06/10/2014 11:03	99500
Silver	NELAP	0.01		**< 0.01**	mg/L	1	06/10/2014 11:03	99500
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.0002		**< 0.0002**	mg/L	1	06/10/2014 11:02	99505
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
1,1-Dichloroethene	NELAP	5000		**ND**	µg/L	1000	06/11/2014 18:27	99633
1,2-Dichloroethane	NELAP	5000		**ND**	µg/L	1000	06/11/2014 18:27	99633
2-Butanone	NELAP	25000		**39700**	µg/L	1000	06/11/2014 18:27	99633
Benzene	NELAP	2000		**ND**	µg/L	1000	06/11/2014 18:27	99633
Carbon tetrachloride	NELAP	5000		**ND**	µg/L	1000	06/11/2014 18:27	99633
Chlorobenzene	NELAP	5000		**ND**	µg/L	1000	06/11/2014 18:27	99633
Chloroform	NELAP	5000		**ND**	µg/L	1000	06/11/2014 18:27	99633
Methylene chloride	NELAP	12500		**299000**	µg/L	2500	06/13/2014 14:03	99711
Tetrachloroethene	NELAP	5000		**ND**	µg/L	1000	06/11/2014 18:27	99633
Trichloroethene	NELAP	5000		**ND**	µg/L	1000	06/11/2014 18:27	99633
Vinyl chloride	NELAP	2000		**ND**	µg/L	1000	06/11/2014 18:27	99633
Surr: 1,2-Dichloroethane-d4		74.7-129		**103.3**	%REC	1000	06/11/2014 18:27	99633
Surr: 4-Bromofluorobenzene		86-119		**102.1**	%REC	1000	06/11/2014 18:27	99633
Surr: Dibromofluoromethane		81.7-123		**100.6**	%REC	1000	06/11/2014 18:27	99633
Surr: Toluene-d8		84.3-114		**101.6**	%REC	1000	06/11/2014 18:27	99633

Elevated reporting limit due to high levels of target and/or non-target analytes.

Teklab, Inc. Environmental Laboratory

Laboratory Results

http://www.teklabinc.com/

Client: Andrews Engineering, Inc.　　**Work Order:** 14060413

Client Project: Brandis Aircraft RCRA　　**Report Date:** 16-Jun-14

Lab ID: 14060413-009　　**Client Sample ID:** S-9

Matrix: AQUEOUS　　**Collection Date:** 06/05/2014 13:42

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 1020B								
Ignitability, Closed Cup		60		**>200**	°F	1	06/09/2014 12:50	R191670
SW-846 7196A								
Chromium, Hexavalent	NELAP	5	H	**53**	mg/L	1000	06/06/2014 18:11	R191651
Results of MS have less certainty because value exceed upper quantitation limits.								
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1		**4.86**		1	06/09/2014 15:15	R191698
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Aluminum	NELAP	5		**67.1**	mg/L	100	06/09/2014 18:45	99500
Arsenic	NELAP	0.025		**< 0.025**	mg/L	1	06/10/2014 11:09	99500
Barium	NELAP	0.5		**4.32**	mg/L	100	06/09/2014 18:45	99500
Cadmium	NELAP	0.2		**9.27**	mg/L	100	06/09/2014 18:45	99500
Chromium	NELAP	1		**60.2**	mg/L	100	06/09/2014 18:45	99500
Lead	NELAP	0.04		**0.207**	mg/L	1	06/10/2014 11:09	99500
Selenium	NELAP	0.05		**< 0.05**	mg/L	1	06/10/2014 11:09	99500
Silver	NELAP	0.01		**< 0.01**	mg/L	1	06/10/2014 11:09	99500
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.0002		**< 0.0002**	mg/L	1	06/10/2014 11:05	99505
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
1,1-Dichloroethene	NELAP	5000		**ND**	µg/L	1000	06/11/2014 18:54	99633
1,2-Dichloroethane	NELAP	5000		**ND**	µg/L	1000	06/11/2014 18:54	99633
2-Butanone	NELAP	25000	J	**25000**	µg/L	1000	06/11/2014 18:54	99633
Benzene	NELAP	2000		**ND**	µg/L	1000	06/11/2014 18:54	99633
Carbon tetrachloride	NELAP	5000		**ND**	µg/L	1000	06/11/2014 18:54	99633
Chlorobenzene	NELAP	5000		**ND**	µg/L	1000	06/11/2014 18:54	99633
Chloroform	NELAP	5000		**ND**	µg/L	1000	06/11/2014 18:54	99633
Methylene chloride	NELAP	5000		**14200**	µg/L	1000	06/11/2014 18:54	99633
Tetrachloroethene	NELAP	5000		**ND**	µg/L	1000	06/11/2014 18:54	99633
Trichloroethene	NELAP	5000		**ND**	µg/L	1000	06/11/2014 18:54	99633
Vinyl chloride	NELAP	2000		**ND**	µg/L	1000	06/11/2014 18:54	99633
Surr: 1,2-Dichloroethane-d4		74.7-129		**104.5**	%REC	1000	06/11/2014 18:54	99633
Surr: 4-Bromofluorobenzene		86-119		**102.9**	%REC	1000	06/11/2014 18:54	99633
Surr: Dibromofluoromethane		81.7-123		**101.9**	%REC	1000	06/11/2014 18:54	99633
Surr: Toluene-d8		84.3-114		**102.1**	%REC	1000	06/11/2014 18:54	99633

Elevated reporting limit due to high levels of target and/or non-target analytes.

Teklab Inc.
Environmental Laboratory

Laboratory Results

http://www.teklabinc.com/

Client: Andrews Engineering, Inc.
Work Order: 14060413
Client Project: Brandis Aircraft RCRA
Report Date: 16-Jun-14
Lab ID: 14060413-010
Client Sample ID: S-10
Matrix: AQUEOUS
Collection Date: 06/05/2014 13:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 1020B								
Ignitability, Closed Cup		60		**>200**	°F	1	06/09/2014 12:50	R191670
SW-846 7196A								
Chromium, Hexavalent	NELAP	5	H	**10**	mg/L	1000	06/06/2014 18:11	R191651
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1		**4.16**		1	06/09/2014 15:16	R191698
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Aluminum	NELAP	5		**63.9**	mg/L	100	06/09/2014 18:51	99500
Arsenic	NELAP	0.025		**< 0.025**	mg/L	1	06/10/2014 11:15	99500
Barium	NELAP	0.5		**4.65**	mg/L	100	06/09/2014 18:51	99500
Cadmium	NELAP	0.2		**3.11**	mg/L	100	06/09/2014 18:51	99500
Chromium	NELAP	1		**25.1**	mg/L	100	06/09/2014 18:51	99500
Lead	NELAP	0.04		**1.29**	mg/L	1	06/10/2014 11:15	99500
Selenium	NELAP	0.05		**< 0.05**	mg/L	1	06/10/2014 11:15	99500
Silver	NELAP	0.01	J	**0.0057**	mg/L	1	06/10/2014 11:15	99500
SW-846 7470A (TOTAL)								
Mercury	NELAP	0.0002	J	**0.00016**	mg/L	1	06/10/2014 11:07	99505
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
1,1-Dichloroethene	NELAP	25000		**ND**	µg/L	5000	06/11/2014 19:21	99633
1,2-Dichloroethane	NELAP	25000		**ND**	µg/L	5000	06/11/2014 19:21	99633
2-Butanone	NELAP	125000	J	**28000**	µg/L	5000	06/11/2014 19:21	99633
Benzene	NELAP	10000		**ND**	µg/L	5000	06/11/2014 19:21	99633
Carbon tetrachloride	NELAP	25000		**ND**	µg/L	5000	06/11/2014 19:21	99633
Chlorobenzene	NELAP	25000		**ND**	µg/L	5000	06/11/2014 19:21	99633
Chloroform	NELAP	25000		**ND**	µg/L	5000	06/11/2014 19:21	99633
Methylene chloride	NELAP	125000		**1290000**	µg/L	25000	06/13/2014 14:30	99711
Tetrachloroethene	NELAP	25000		**ND**	µg/L	5000	06/11/2014 19:21	99633
Trichloroethene	NELAP	25000		**ND**	µg/L	5000	06/11/2014 19:21	99633
Vinyl chloride	NELAP	10000		**ND**	µg/L	5000	06/11/2014 19:21	99633
Surr: 1,2-Dichloroethane-d4		74.7-129		**104.1**	%REC	5000	06/11/2014 19:21	99633
Surr: 4-Bromofluorobenzene		86-119		**103**	%REC	5000	06/11/2014 19:21	99633
Surr: Dibromofluoromethane		81.7-123		**100.5**	%REC	5000	06/11/2014 19:21	99633
Surr: Toluene-d8		84.3-114		**102.6**	%REC	5000	06/11/2014 19:21	99633

Elevated reporting limit due to high levels of target and/or non-target analytes.

Teklab, Inc. Environmental Laboratory

Laboratory Results

http://www.teklabinc.com/

Client: Andrews Engineering, Inc. Work Order: 14060413

Client Project: Brandis Aircraft RCRA Report Date: 16-Jun-14

Lab ID: 14060413-011 Client Sample ID: S-11

Matrix: AQUEOUS Collection Date: 06/05/2014 14:20

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 1020B								
Ignitability, Closed Cup		60		**<60**	°F	1	06/09/2014 12:50	R191670
SW-846 7196A								
Chromium, Hexavalent	NELAP	5	H	**< 5**	mg/L	1000	06/06/2014 18:12	R191651
Elevated reporting limit due to sample composition.								
SW-846 9040B, LABORATORY ANALYZED								
Lab pH	NELAP	1		**6.11**		1	06/09/2014 15:18	R191698
SW-846 3050B, 6010B, METALS IN OIL BY ICP								
Aluminum		4.95		**80**	mg/Kg	1	06/10/2014 14:40	99530
Arsenic		2.48		**< 2.48**	mg/Kg	1	06/10/2014 14:40	99530
Barium		0.5		**60.8**	mg/Kg	1	06/11/2014 13:06	99530
Cadmium		0.2		**0.34**	mg/Kg	1	06/10/2014 14:40	99530
Chromium		0.99	S	**216**	mg/Kg	1	06/10/2014 14:40	99530
Lead		3.96		**< 3.96**	mg/Kg	1	06/10/2014 14:40	99530
Selenium		4.95		**< 4.95**	mg/Kg	1	06/10/2014 14:40	99530
Silver		0.99		**< 0.99**	mg/Kg	1	06/10/2014 14:40	99530
MS QC limits for Cr are not applicable due to high sample/spike ratio.								
SW-846 7471B IN OIL								
Mercury		0.01		**0.022**	mg/Kg	1	06/11/2014 9:59	99577
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
1,1-Dichloroethene	NELAP	20000000		**ND**	µg/L	4E+06	06/10/2014 23:35	99589
1,2-Dichloroethane	NELAP	20000000		**ND**	µg/L	4E+06	06/10/2014 23:35	99589
2-Butanone	NELAP	100000000		**527000000**	µg/L	4E+06	06/10/2014 23:35	99589
Benzene	NELAP	8000000		**ND**	µg/L	4E+06	06/10/2014 23:35	99589
Carbon tetrachloride	NELAP	20000000		**ND**	µg/L	4E+06	06/10/2014 23:35	99589
Chlorobenzene	NELAP	20000000		**ND**	µg/L	4E+06	06/10/2014 23:35	99589
Chloroform	NELAP	20000000		**ND**	µg/L	4E+06	06/10/2014 23:35	99589
Methylene chloride	NELAP	20000000		**ND**	µg/L	4E+06	06/10/2014 23:35	99589
Tetrachloroethene	NELAP	20000000		**ND**	µg/L	4E+06	06/10/2014 23:35	99589
Trichloroethene	NELAP	20000000		**ND**	µg/L	4E+06	06/10/2014 23:35	99589
Vinyl chloride	NELAP	8000000		**ND**	µg/L	4E+06	06/10/2014 23:35	99589
Surr: 1,2-Dichloroethane-d4		74.7-129		**101.7**	%REC	4E+06	06/10/2014 23:35	99589
Surr: 4-Bromofluorobenzene		86-119		**100.8**	%REC	4E+06	06/10/2014 23:35	99589
Surr: Dibromofluoromethane		81.7-123		**100.9**	%REC	4E+06	06/10/2014 23:35	99589
Surr: Toluene-d8		84.3-114		**100.5**	%REC	4E+06	06/10/2014 23:35	99589
Elevated reporting limit due to high levels of target and/or non-target analytes.								

Teklab Inc.
Environmental Laboratory

Receiving Check List

http://www.teklabinc.com/

Client: Andrews Engineering, Inc.
Client Project: Brandis Aircraft RCRA

Work Order: 14060413
Report Date: 16-Jun-14

Carrier: Sean Spinner

Received By: SRH

Completed by: Emily E. Pohlman
On: 06-Jun-14

Reviewed by: Shelly A. Hennessy
On: 06-Jun-14

Pages to follow: Chain of custody [2] Extra pages included [0]

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C 0.6
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐	Dry Ice ☐
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☐	No ☑		
Reported field parameters measured:	Field ☐	Lab ☑	NA ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐		

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

Water – at least one vial per sample has zero headspace?	Yes ☐	No ☑	No VOA vials ☐
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	NA ☐
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑

Any No responses must be detailed below or on the COC.

Aqueous samples did not meet hold time requirements for hexavalent chromium. Client was notified via workorder summary.

Headspace was present in 2 of 2 volatile vials for S-1, S-2, S-4, S-5, S-7, S-10, S-11. Client was notified via workorder summary.

R000311

CHAIN OF CUSTODY

pg. 1 of 2 Work Order # 14060413

TEKLAB, INC. 5445 Horseshoe Lake Road ~ Collinsville, IL 62234 ~ Phone: (618) 344-1004 ~ Fax: (618) 344-1005

Client: Andrews Engineering
Address: 3300 Ginger Creek Drive
City / State / Zip: Springfield, IL 62711
Contact:
Phone: 217-787-2334
E-Mail:
Fax: 217-787-9495

Samples on: ☒ Ice ☐ Blue Ice ☐ No Ice 0.6 °C
Preserved in: ☐ Lab ☒ Field EED 6/6/14 FOR LAB USE ONLY
Lab Notes:
* headspace in 2 of 2 vials SPH 6/6/14
Comments: DK headspace in 1 of 2 vials for S-8 SPH 6/6/14
Teklab, Inc.
Chain Field

- Are these samples known to be involved in litigation? If yes, a surcharge will apply. ☐ Yes ☐ No
- Are these samples known to be hazardous? ☐ Yes ☐ No
- Are there any required reporting limits to be met on the requested analysis? If yes, please provide limits in comment section. ☐ Yes ☐ No

Project Name / Number: Brandis AIRCraft
Sample Collector's Name: Tim Kemper

Results Requested: ☐ Standard ☐ 1-2 Day (100% Surcharge) ☐ Other______ ☐ 3 Day (50% Surcharge)

Billing Instructions:

Lab Use Only	Sample Identification	Date/Time Sampled	UNPRES	HNO_3	NaOH	H_2SO_4	HCL	MeOH	$NaHSO_4$	Other	Water	Drinking Water	Soil	Sludge	Sp. Waste	pH	Flashpoint	VOC's	metals	Hexavalent Cr
14060413-001	S-1 *	6-5-14 12:04														X	X	X	X	X
-002	S-2 *	12:12																		
-003	S-3	12:47																		
-004	S-4 *	12:26																		
-005	S-5 *	12:52																		
-006	S-6	13:14																		
-007	S-7 *	13:22																		
-008	S-8	13:34																		
-009	S-9	13:42																		
-010	S-10 *	13:50														X	X	X	X	X

Relinquished By	Date / Time	Received By	Date / Time
T. Kemper	6/6/14 8:15	[signature]	6/6/14 8:15
[signature]	6/6/14 1520	Stephanie Hayes	6/6/14 1520

The individual signing this agreement on behalf of client acknowledges that he/she has read and understands the terms and conditions of this agreement, on the reverse side, and that he/she has the authority to sign on behalf of client.

WHITE – LAB YELLOW – SAMPLER'S COPY

R000312

CHAIN OF CUSTODY

pg. 2 of 2 Work Order # 14060413

TEKLAB, INC. 5445 Horseshoe Lake Road ~ Collinsville, IL 62234 ~ Phone: (618) 344-1004 ~ Fax: (618) 344-1005

Client: Andrews Engineering
Address: 3300 Ginger Creek Drive
City / State / Zip: Springfield, IL 62711
Contact:
Phone: 217-787-2334
E-Mail:
Fax: 217-787-9495

Samples on: ☒ Ice ☐ Blue Ice ☐ No Ice ______ °C
Preserved in: ☐ Lab ☐ Field FOR LAB USE ONLY
Lab Notes:

Comments:

- Are these samples known to be involved in litigation? If yes, a surcharge will apply. ☐ Yes ☐ No
- Are these samples known to be hazardous? ☐ Yes ☐ No
- Are there any required reporting limits to be met on the requested analysis? If yes, please provide limits in comment section. ☐ Yes ☐ No

Project Name / Number: Brandis

Sample Collector's Name:

Results Requested: ☐ Standard ☐ 1-2 Day (100% Surcharge) ☐ Other______ ☐ 3 Day (50% Surcharge)

Billing Instructions:

Lab Use Only	Sample Identification	Date/Time Sampled	UNPRES	HNO_3	NaOH	H_2SO_4	HCL	MeOH	$NaHSO_4$	Other	Water	Drinking Water	Soil	Sludge	Sp. Waste	pH	Flash point	VOC's	Metals	Hexavalent Cr.								
14060413-011	S-11 *	6-5-14 14:20														X	X	X	X	X								

Teklab, Inc.
Courier Pick Up

Relinquished By	Date / Time	Received By	Date / Time
T. Hempe	6/6/14 8:15	[signature]	6/6/14 8:15
[signature]	6/6/14 15:20	Stephanie Hayes	6/6/14 15:20

The individual signing this agreement on behalf of client acknowledges that he/she has read and understands the terms and conditions of this agreement, on the reverse side, and that he/she has the authority to sign on behalf of client.

WHITE – LAB YELLOW – SAMPLER'S COPY

Brandis Aircraft
Sample Date - June 05, 2014

Sample ID			S-1	S-2	S-4	S-5	S-7	S-8	S-9	S-10	S-11
Drum ID			F	G	I	J	R	S	T	V	W
Sample Type			Aqueous	Aqueous	Aqueous	Aqueous	Aqueous	Aqueous	Aqueous	Aqueous	Aqueous
Percent Moisture			na	na	na	na	na	na	na	na	na
Parameter	Units	Limit[1]									
Ignitability	deg F	>140	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200	< 60
Chromium, hexavalent	mg/L	na	< 0.025	< 0.025	25	0.5	9	23	53	10	< 5
pH (lab)		2 - 12.5	3.05	3.1	3.45	3.15	4.1	4.33	4.86	4.16	6.11
Aluminum	mg/L	na	24.2	15.6	11	16.3	17.1	23.9	67.1	63.9	80
Arsenic	mg/L	5	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 2.48
Barium	mg/L	100	0.269	0.279	0.473	0.636	0.611	0.206	4.32	4.65	60.8
Cadmium	mg/L	1	4.15	6.54	2.41	1.93	8.11	9.77	9.27	3.11	0.34
Chromium	mg/L	5	11.6	12.2	34.5	16.2	23.6	23.4	60.2	25.1	216
Lead	mg/L	5	0.182	0.134	0.0745	0.134	0.2	J 0.024	0.207	1.29	< 3.96
Selenium	mg/L	1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 4.95
Silver	mg/L	5	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	J 0.0057	< 0.99
Mercury	mg/L	0.2	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	J 0.00016	0.022
1,1-Dichloroethene	ug/L	700	< 2500000	< 2500000	< 25000	< 25000	< 25000	< 5000	< 5000	< 25000	< 20000000
1,2-Dichloroethane	ug/L	500	< 2500000	< 2500000	< 25000	< 25000	< 25000	< 5000	< 5000	< 25000	< 20000000
2-Butanone	ug/L	200000	< 12500000	< 12500000	177000	J 31000	J 51000	39700	J 25000	J 28000	527000000
Benzene	ug/L	500	< 1000000	< 1000000	< 10000	< 10000	< 10000	< 2000	< 2000	< 10000	< 8000000
Carbon tetrachloride	ug/L	500	< 2500000	< 2500000	< 25000	< 25000	< 25000	< 5000	< 5000	< 25000	< 20000000
Chlorobenzene	ug/L	100000	< 2500000	< 2500000	< 25000	< 25000	< 25000	< 5000	< 5000	< 25000	< 20000000
Chloroform	ug/L	6000	< 2500000	< 2500000	< 25000	< 25000	< 25000	< 5000	< 5000	< 25000	< 20000000
Methylene Chloride	ug/L	na	15200000	14100000	642000	5130000	728000	299000	14200	1290000	< 20000000
Tetrachloroethene	ug/L	700	< 2500000	< 2500000	< 25000	< 25000	< 25000	< 5000	< 5000	< 25000	< 20000000
Trichloroethene	ug/L	500	< 2500000	< 2500000	< 25000	< 25000	< 25000	< 5000	< 5000	< 25000	< 20000000
Vinyl Chloride	ug/L	200	< 1000000	< 1000000	< 10000	< 10000	< 10000	< 2000	< 2000	< 10000	< 8000000

Notes:

[1] Limit is the Hazardous Waste Limit listed in 35 IAC Section 721.124.

[2] Shaded cell indicates a detected exceedence of the Hazardous Waste Limit

[3] Elevated reporting limits due to high concentrations of target analytes.

[4] "na" indicates no Hazardous Waste Limit listed in 35 IAC Section 721.124.

[5] "J" indicates analyte detected below quantitation limit.

Brandis Aircraft
Sample Date - June 05, 2014

		Sample ID		S-3		S-6
		Drum ID		H		P
		Sample Type		Solid		Solid
		Percent Moisture		45		63.4
Parameter	Units	Limit[1]				
Ignitability	deg F	>140	>	200	>	200
Chromium, hexavalent	mg/kg	na	<	346	<	530
pH (lab)		2 - 12.5		3.98		5.56
Aluminum	mg/kg	na		12100		12000
Arsenic	mg/kg	5	<	2.5	J	1.4
Barium	mg/kg	100		1370		1110
Cadmium	mg/kg	1		70.5		149
Chromium	mg/kg	5		2840		2580
Lead	mg/kg	5		1250		511
Selenium	mg/kg	1	<	4	<	3.64
Silver	mg/kg	5		0.57		0.75
Mercury	mg/kg	0.2	J	0.006	J	0.01
1,1-Dichloroethene	ug/kg	700	<	217000	<	79500
1,2-Dichloroethane	ug/kg	500	<	217000	<	79500
2-Butanone	ug/kg	200000	<	2170000	<	795000
Benzene	ug/kg	500	<	43300	<	15900
Carbon tetrachloride	ug/kg	500	<	217000	<	79500
Chlorobenzene	ug/kg	100000	<	217000	<	79500
Chloroform	ug/kg	6000	<	217000	<	79500
Methylene Chloride	ug/kg	na		5450000		607000
Tetrachloroethene	ug/kg	700	<	217000	J	25000
Trichloroethene	ug/kg	500	<	217000	J	19000
Vinyl Chloride	ug/kg	200	<	86600	<	31800

Notes:

[1] Limit is the Hazardous Waste Limit listed in 35 IAC Section 721.124.

[2] Shaded cell indicates a detected exceedence of the Hazardous Waste Limit

[3] Elevated reporting limits due to high concentrations of target analytes.

[4] "na" indicates no Hazardous Waste Limit listed in 35 IAC Section 721.124.

[5] "J" indicates analyte detected below quantitation limit.

ATTACHMENT L

LPC # 0210600007– Christian County
Taylorville/The Paint Shop
USEPA #ILD982621690
FOS FILE

and

LPC # 0210605081– Christian County
Taylorville/Evergreen Aviation
FOS FILE

The attached IEPA site safety plan was used in conjunction with sampling at the north hangar (0210600007) conducted on June 5, 2014. It includes fresh reprinted (clean) copies of the original plan and the actual signature page from the copy used on-site for a total of 25 pages including this cover sheet.

Illinois Environmental Protection Agency

SAMPLING ANALYSIS PLAN AND HEALTH AND SAFETY PLAN

for

LPC #0210600007 – Christian County Taylorville/The Paint Shop (a Brandis Aircraft facility)

JUNE 4, 2014

Prepared by:
Steve Townsend, Paul Eisenbrandt and David C. Jansen
Illinois Environmental Protection Agency
Bureau of Land
Field Operations Section

Reviewed and approved by Blaine Kinsley

LIST OF ACRONYMS

BOL	Bureau of Land
COC	Chain of Custody
COCD	Chain of Custody Document
FOS	Field Operations Section
HASP	Health and Safety Plan
ID	Identification Data
Illinois EPA	Illinois Environmental Protection Agency
PPE	Personal Protective Equipment
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
SAP	Sampling Analysis Plan
SOP	Standard Operating Procedure
UIC	Underground Injection Control

1. INTRODUCTION

This Sampling Analysis Plan (SAP) and Health and Safety Plan (HASP) have been prepared by the Illinois Environmental Protection Agency (Illinois EPA) as a project planning document for the implementation of an environmental sampling event. The SAP summarizes the field tasks necessary to collect samples for subsequent chemical or physical analysis. The objective of this effort is to determine the chemical nature and/or potential hazardous nature of the wastes at the The Paint Shop facility. Upon completion, the data will be used by the Illinois EPA to assess compliance with the regulations, and to request removal and proper disposal of the wastes. The remainder of the SAP describes the tasks associated with sample handling, shipment, and analysis. The HASP gives site specific health and safety information, such as site hazards, type of air monitoring to be performed, protective equipment to be worn, local emergency numbers and maps to nearest emergency facilities.

This sampling and analysis plan presents the methods used to conduct the field investigation, document the field activities, analyze the samples, and ensure the health and safety of the field team during sampling activities. Section 1 discusses the background and goals of the project. Section 2 discusses field methods for sample collection. Section 3 describes documentation requirements, and Section 4 describes the reporting requirements for the projects. Section 5 is the HASP and discusses the health and safety measures that will be followed by the Project Team Members in the field.

1.1 PROJECT HISTORY AND SUMMARY

The facility is the current operational location of The Paint Shop located on property adjacent to a runway at the Taylorville Municipal Airport. The owners of the facility are Robert J. and Michael J. Brandis, who operate Brandis Aircraft. A Resource Conservation and Recovery Act (RCRA) Compliance Evaluation Inspection (CEI) was conducted by Steve Townsend and Paul Eisenbrandt on May 16, 2014, at this aircraft stripping and painting facility located at 2301 S. Spresser Street in Taylorville, Illinois. As a result of the referenced inspection it was determined that this facility was a large quantity hazardous waste generator and that the previous waste determination did not accurately characterize the waste generated based on the last manifested shipment of waste in 2010.

A follow-up visit to the facility was made on May 21, 2014. At this time the facility claimed to have generated the wastes seen during the May 16, 2014 inspection on May 13, 2014. On May 21, 2014, The Paint Shop owners were informed that the Agency was requesting that the waste in drums, bags of stripped paint waste and paint booth filters be sampled and analyzed to make a proper waste determination and that the Agency wished to collect split samples and analyze to confirm waste determinations. The Paint Shop/Brandis Aircraft arranged to have samples collected by Andrews Engineering on June 5, 2014.

1.2 PURPOSE OF THE STUDY

The purpose of this project is to obtain representative samples of wastes to determine if those wastes are hazardous wastes, to confirm the determination made by the facility based on their sampling and analysis and to determine the approximate volume (and weight) of the wastes present to confirm how the facility is regulated under RCRA. Not all waste containers or tanks need to be sampled. A sufficient number of samples to make a proper waste determination and confirm their regulatory status will be collected. This number will be based on what is found when the drums are opened. Sampling may include but not necessarily be limited to drums and containers of waste rinse-water and sludge, bags of stripped paint waste, and sumps. Samples of wastes will not be taken from containers or tanks that cannot be safely accessed or opened, and samples of waste will not be taken if their collection, transport, or analysis by the lab will pose an unnecessary risk or endanger Illinois EPA personnel.

The names and/or descriptions of the wastes, and their locations, are:

A. Fourteen (14) plastic 55-gallon drums said to contain rinse-water with paint stripper in The Paint Shop hangar. Therefore, up to 14 samples, one from each drum may need to be taken.

B. Three (3) blue plastic totes seen outside the storage shed on May 16, 2014.

C. Two (2) 55 gallon closed drums said to contain waste solids/sludge from treating the rinse-water. One from near the rinse-water drums seen on May 16, 2014, and one located outside the hangar on May 16, 2014, now moved inside the hangar.

D. Approximately 9 plastic bags containing stripped paint waste located in the north half of the Paint Shop hangar. .

The identified hazardous constituents of concern for this project are Methylene Chloride, formic acid, acetic acid and toluene. Methyl Ethyl Ketone is used in the building and is present in the atmosphere and potentially the wastes.

1.3 PROJECT TEAM

Project team members include the following personnel: Paul Eisenbrandt, Mark Weber, and Steve Townsend, all of BOL/FOS Springfield Region. James Stufflebeam and Stephennie Brumley of Andrews Engineering will collect the samples.

In advance of mobilizing to the facility, all members of the Project Team will have reviewed pertinent sections of the BOL's Sampling SOPs to refresh themselves on sampling methods and procedures.

SAMPLING ACTIVITIES

2.1 PROPOSED SAMPLING LOCATIONS, MEDIA, AND METHODS

Samples suspected to contain Methylene Chloride, toluene, acetic acid, and formic acid will be collected from the Paint Shop on June 5, 2014. A schematic of the hangar building and projected sample areas identified, is attached to this Plan. Pertinent photographs that show approximate sampling locations are also attached to this Plan.

Up to nine (9) liquid samples will be taken. The number of solid samples to be taken will be between zero (0) and six (6).

Liquid samples of wastes from drums opened by Andrews Engineering. will be collected by Andrews Engineering. A split of these samples will be collected Paul Eisenbrandt using Illinois EPA sample containers.

Grab samples will be collected from the sumps and bagged waste and placed in sample containers.

A liquid sample will be taken from the totes by pouring or using a glass rod.

2.2 SAMPLE DESIGNATION AND PROCESSING

All samples will be labeled and identified in accordance with the RCRA/UIC QAPP Section B3 ("Sampling, Handling and Custody"), and as described in Section 2.3 and Section 3 of this document. These field sample numbers will be used to label the sample containers and to identify them on the COCD and any field notes. The Division of Laboratories will assign their own identifying numbers upon receipt of the samples.

2.3 SAMPLE LABELS

Sample containers will be clearly labeled according to procedures established in the RCRA/UIC QAPP and the BOL/FOS COC SOP. Black ink will be used. At a minimum, sample labels will contain the following information:

- Sample identification numbers
- Sample date

The sample label will be attached to the sample container prior to, or just after, the container is filled and the lid secured. As an added measure of security, and if possible, the finished label should be covered with clear packaging tape to protect the ink from moisture and to tightly secure the label to the sample container. Information on the sample label must match the information on the COCD as specified in the BOL/FOS COC SOP and in the field log for each sample.

2.4 PROPOSED ANALYSES

The samples collected will be analyzed for the following:

TCLP constituents, in accordance with 35 I.A.C. 721.124 to check for concentrations equal to or greater than those listed in 721.124(b). Samples will be analyzed for **VOC's. Additional TCLP organics analyses will be requested for any organic VOC constituent exceeding a TCLP regulatory level.**

Flash point for any liquid sample of suspected organic chemicals, in accordance with 35 I.A.C. 721.121.

pH to test for corrosivity, in accordance with 35 I.A.C. 721.122.

2.5 EQUIPMENT DECONTAMINATION

Disposable sampling equipment will be used to the maximum extent possible. Pre-cleaned, reusable equipment will be used only if necessary. This should eliminate the need for any decontamination in the field. Non-disposable equipment used during this study will be decontaminated at the site or decontaminated at Illinois EPA offices, if on-site decontamination is not possible, as described in the BOL's Sampling SOPs.

Any disposable equipment that comes into contact with the material being sampled is potentially contaminated by hazardous constituents, and therefore will be handled accordingly. Contamination of equipment, clothing, safety gear, and other miscellaneous material will be kept to a minimum. The Illinois EPA sampler will use his judgment in determining if they have generated any contaminated objects or materials during sampling activities. Any contaminated materials will be placed in a trash bag and left at the site for subsequent proper disposal. If room is available this waste will be placed in the drum with the bags of paint stripper waste and plastic.

3. PROJECT DOCUMENTATION

3.1 FIELD NOTES

Sample team members will take field notes as a record of investigation operations as sampling activities proceed. The notes will contain the date, time, and description of all field activities performed; names of personnel; weather conditions; names of visitors to the site; areas where photographs were taken; and any other data pertinent to the project. The field notes will also contain all sample collection and identification information and a drawing of the area sampled, along with the approximate location of where each sample was taken. The notes from all team members will be compiled by the lead inspector and incorporated into an inspection report. The inspection report is the official, legal record of site activities.

3.2 PHOTO DOCUMENTATION

Photographs will be taken of the building interior and exterior, and of each container or bag and sample. These photos will help identify the location and will provide an accurate visual record of the wastes being sampled. All photographs taken will be identified in the inspection report. Photos will be identified, described and managed according to Administrative Procedure #41, Digital Photograph Management.

3.3 FIELD CHANGE PROCEDURE

When in the field, it may be necessary to deviate from the procedures outlined in this plan or in the BOL's Sampling SOPs. It will ultimately be the responsibility of the lead inspector/sampler Safety Officer to decide when such changes are to be made. When it becomes necessary to modify a program or task, the changes will be documented in the inspection report.

3.4 SAMPLE CUSTODY/TRACKING

The samples collected must be traceable from the time they are collected until their derived data are used in the final report. In general, the following provisions apply to sample handling:

- The FOS sampling team leader will be responsible for the care and custody of the splits from samples collected until they are properly transferred or dispatched to another team member or to the designated laboratory.

- All appropriate documentation forms will be used, including sample labels, COCDs, and any other appropriate forms. Documentation will be completed neatly using black ink.

- When transferring possession of samples, the individuals relinquishing and receiving them will sign, date, and note the time on the COCD(s) per its instructions.

- Sample containers will be packed in plastic bags; each bag will be taped shut and sealed with evidence tape (see BOL/FOS COC SOP). The bagged samples will then be packed in coolers with wet ice or blue ice packs so that the samples are properly cooled.

- If multiple shipping containers are being hand-delivered to the laboratory by an Agency representative, each container need not have its own COCD, and up to 10 samples may be listed on one COCD. A copy of the COCD will be retained by the FOS Sampler for inclusion in the field report.

- All samples will be transported to the appropriate laboratory via direct delivery only. The lead Sampler is responsible for determining the proper method for delivering the samples to the laboratory.

BOL Chain of Custody procedures including Chain of Custody Documents, sample labels, custody seals, and other sample documents are detailed in the BOL/FOS COC SOP. This procedure will be followed to maintain a defensible chain of custody for all samples collected. The COCD will be filled out as the samples are collected and will be double-checked prior to the transport of the samples to the laboratory. Copies of the COCD will be included in the inspection report. At a minimum, the COCD will contain the following information:

- Name of site
- Names of samplers/processing personnel
- Sample identification numbers
- Sampling date
- Sampling time
- Number of containers per sample and volume of sample
- Analyses requested

4. REPORTS

Reporting for this project includes laboratory reports, quality assurance reports, and the inspection report.

4.1 LABORATORY/QUALITY ASSURANCE REPORTS

A final laboratory report will be prepared by the Illinois EPA's Division of Laboratories or the Agency's contracted laboratory. The laboratory procedures applicable to this project can be found in the RCRA/UIC QAPP and the Division of Laboratories SOPs. The laboratory completes a quality assurance/quality control (QA/QC) and data validation report. This report will identify any laboratory activities that deviated from the referenced protocols and a statement will be made regarding the overall validity of the data. The final written laboratory chemical analyses report will contain the following:

- Client name
- Sample collector's name
- Project/Facility Number
- Date sample received in the laboratory

- Funding code
- Client sample ID (Field ID)
- Lab sample ID
- Matrix
- Date/Time Collected
- Sample Type
- Method sample was analyzed by
- Date analysis performed
- Units (result)
- Sample/Analyze Qualifiers
- Result
- Reporting limit
- Regulatory level (if applicable)
- Case narrative explaining any problems encountered in the laboratory from sample receipt through sample reporting

4.2 INSPECTION REPORT

A final written report will be prepared documenting all activities associated with collection, transportation and analysis of samples. The laboratory reports (and/or appropriate summaries) will be included as appendices. At a minimum, the following will be included in the final report:

- Brief description of the project and its objectives
- Type of sampling equipment used
- Identification and description of protocols used during sampling and testing, and an explanation of any deviations from the sampling plan protocols
- Description or summary of sampling procedures
- Descriptions of each sample (i.e., sample logs)

- Summary of methods used to locate the sampling positions and a discussion of the position accuracy [Not applicable for groundwater samples]

- A plan view of the project showing the actual sampling locations

- Summary of all test results and data (hard copy and electronic)

5. HEALTH AND SAFETY PLAN

This section describes the health and safety plan (HASP) that will be used for this project. The HASP is a written plan detailing the site's health and safety hazards, job tasks and operations, and the specific control measures used to ensure employee health and safety. Standard safety practices described in the BOL Health and Safety Plan and Procedures will be followed. [The project leader must prepare a site specific HASP by completing the following sections. All project team members listed in Section 1.3 of the SAP and Section II of the HASP must read and follow the HASP. The HASP must be readily available to all employees on the site.] Applicable IEPA standard practices and ocedures will be followed regarding health and safety, sampling, chain of custody, and inspecting the facility.

5.1 Tasks to be accomplished:

Task A

Unload equipment from Illinois EPA vehicle in Paint Shop parking lot of facility, and have building owner open bay doors on north and south sides of building, and leave doors open during the course of air monitoring and waste sampling.

Wearing Level D Personal Protection Equipment (PPE), prior to any waste sampling, conduct ambient air monitoring of all sampling areas inside the building with the available air monitoring equipment such as TVA/PID prior to the 10:00 a.m. sample collection time. The ambient air monitoring will be initiated outdoors and then inside the Paint Shop after the overhead doors are opened, and fresh air is allowed to enter. One (1) team member will be assigned the instruments referenced above and report any anomalies to the on-site health and safety officer and to the project manager. This team member will then enter Paint Shop hangar and conduct air monitoring in the areas where samples will be collected. Air monitoring will be maintained while Andrews Engineering collects samples and team members are in the building. Air monitoring will be maintained while team members are in the building.

Proceed to Task B only after the actions indicated above are completed.

Task B

Wearing modified level C or D PPE. Split samples with Andrews Engineering and collect samples of drums sumps, totes, and bagged wastes described above if deemed necessary. During Task B team members will wear protective outer clothing including a Saranex suit, inner gloves, and full length neoprene rubber gloves, chemical boots, outer boots, a hard hat, and a splash shield. If air monitoring shows a need a respirator will be used. Containers will be closed immediately after the collection of the sample. Under no circumstance will IEPA personnel enter a confined space during the sampling or while on-site.

Label and pack samples in one or more coolers containing blue ice packs. Corrosive or caustic samples will not be packed with wet ice. Corrosive, caustic, or organic samples will be carried in separate coolers to avoid incompatibility and reactive hazards. Blue ice packs will be sealed in plastic bags. Fill out COCD, record any additional comments about the sampling, per instructions contained in this report.

Task C

Leave sampling area, remove disposable PPE and other contaminated materials and leave at the site in plastic bags and place in the drum or drums where bagged wastes containing stripper solids on plastic are placed if room is available. Contain reusable equipment and gear in plastic bags and remove for cleaning at Illinois EPA.

Start Date/Time:	June 5, 2014 9:00 a.m.	**Complete Date/Time:**	June 5, 2014 5:00 p.m or when completed on June 5, 2014.

Site Description/History

[A site characterization and analysis including a review of historical data is used to choose and justify engineering controls, work practices and PPE. Describe site conditions and list likely contaminants and sources.]

The site is the location of an aircraft painting shop where old paint is stripped from aircraft using methylene chloride, aircraft are prepped for paint using Methyl Ethyl Ketone, and aircraft are painted. The facility is a single story aircraft hangar. Sampling will be confined to the hangar where waste in drums are located, sumps, filters, bags of waste and where the totes are located inside or outside the hangar. Some machinery aircraft are equipment, drums and bags of wastes are present. Electricity, overhead lighting, and running water are available in the building.

Topography

The topography of this site appears to be irrelevant, inasmuch as the sampling is being conducted indoors on level floors. The ground where the facility is located appears to be level.

Surrounding Population

The surrounding area around the facility is commercial and agricultural to the south and east and is commercial to the north. Air airport is located to the west.

Additional Information

The Taylorville Police and Fire Departments will be contacted by Steve Townsend prior to the sampling to let them know what is going on and to inform them of the possible need of their assistance for crowd control and safety reasons.

5.2 PERSONNEL

	Name
1	Steve Townsend, Inspector, BOL/DLPC/FOS – Springfield Region - Team Leader – Note taker, photographer
2	Paul Eisenbrandt, Geologist, BOL/DLPC/FOS – Springfield Region – Air Monitoring /Sampler/Bottles/Lab
3	Mark Weber, Inspector, BOL/DLPC/FOS – Springfield Region – Air Monitoring /Sampler/Bottles/Lab
4	James Stufflebeam, Andrews Engineering – Sampler
5	Stephennie Brumley, Andrews Engineering

5.3 HAZARD EVALUATION

Chemical hazards anticipated:

Chemical Name	Permissible 8-Hour Exposure Limit (PEL)	Immediately Dangerous to Life and Health (IDLH)	Ionization Potential (IP)	Lower Explosive Limit (LEL)	Route of Entry
MEK	200 ppm	3000 ppm	9.45eV	1.4%	Inhal
Methylene Chloride	25 ppm	2300 ppm	11.32eV	13%	Inhal
Toluene	100 ppm*	500 ppm	8.82eV	1.1%	Inhal
Formic Acid	5 ppm	30 ppm	11.05eV	18%	Inhal
Acetic Acid	10 ppm	50 ppm	10.66eV	4.0%	Inhal

***NIOSH 100ppm OSHA 200 ppm**

Physical hazards anticipated [Identify hazard and define measures that will be taken to protect workers.]

Hazard:	Splash – especially from acid, but also from other potentially hazardous liquids
Hazard control:	Level C PPE with Saranex suits, neoprene and silver shield gloves, neoprene boots (and latex booties), hard hats, and face shields. Bring 30 to 35 gallons of clean tap water for rinsing skin or eyes until transport to hospital.

Hazard:	Ingestion exposure
Hazard control:	Full face respirator. No eating or drinking in work areas, or while wearing contaminated gloves.

Hazard:	Tripping over or running into equipment or clutter
Hazard control:	Proceed with caution

Hazard:	Heat/fatigue
Hazard control:	Take frequent breaks, drink plenty of water outside work areas, wear cool vests, use water rinse or AC in vehicle for cooling

Hazard:	Incompatibility or reactivity of chemicals
Hazard control:	Do not allow corrosives to contact water, ice, caustics or organics on sampling gloves or other PPE, sampling equipment, or in sample coolers. Pre-screen samples with pH paper, and change outer gloves or sampling tubes between samples, as necessary

5.4 STANDARD OPERATING PROCEDURES (SOPS):

- [Below is a list of SOPs. Include only the SOPs that apply to this site specific HASP. Delete the SOPs that do not apply (e.g., if the sampling will be conducted in December, delete the SOP on Heat Stress).]
- Heat Stress: follow the attached BOL Health and Safety Procedure.
- All activities on site must be cleared through the Project Team Leader.
- Normal and Emergency Communications: A cell phone is mandatory. This will be kept by the Project Team Leader. On-site signal strength will be tested upon arrival.
- All operations and equipment will comply with OSHA Regulations 29 CFR 1910.120 and other applicable elements of OSHA 29 CFR 1910 and 1926. Before site operations begin all employees involved in these operations will have read and understood this site safety plan.
- All site personnel are required to have 40-hour HAZWOPER training and, at a minimum, respirator fitness certification. Employees with 24-hour training may perform specific tasks, provided that it is ensured that they will not be exposed to health hazards above permissible exposure limits. Visitors or support personnel

who remain in the support zone are not required to have health and safety training.

- Opening drums and containers: due to the possibility of internal pressurization, proceed with caution, and use shielding.

- Full Face Respirators will be used and cared for as described in the attached BOL Health and Safety Procedure.

- The selection of chemical protective clothing (CPC) will follow the attached BOL Health and Safety Procedure.

- For hostile people-violence at field work, follow the attached BOL Health and Safety Procedure.

5.5 PERSONAL PROTECTIVE EQUIPMENT

Based on evaluation of potential hazards, the following levels of personal protective equipment have been designated for the applicable work areas or tasks. No changes to the specified levels of protection shall be made without the approval of the site safety officer/project team leader Steve Townsend.

Work Area/Zone	Job Function/Task	Level of Protection: C D Other
Paint Shop	Sampling suspected Methylene Chloride and Acid stripper rinse-water and solids waste acid in sump (2)	D or C - with Splash Shields

Work Area/Zone	Job Function/Task	Level of Protection: C D Other
Paint Shop	Sampling suspected Methylene Chloride and Acid stripper waste in drums	D or C - with Splash Shields

Work Area/Zone	Job Function/Task	Level of Protection: C D Other
Paint Shop	Sampling suspected Methylene Chloride and Acid stripper rinse-water waste in drums	D or C - with Splash Shields

Work Area/Zone	Job Function/Task	Level of Protection: C D Other
Paint Shop	Sampling suspected Methylene Chloride and Acid stripper waste in bags	D or C - with Splash Shields

Work Area/Zone	Job Function/Task	Level of Protection: C D Other
Paint Shop, Storage shed, or outside	Sampling Tote	D or C - with Splash Shields

The following specific PPE items have been selected:

	Latex gloves	x	**Nitrile inner gloves**	x	**Neoprene gloves (shoulder length)**
	Butyl gloves	x	**Silver Shield outer gloves**	x	**Chemical-resistant boots**
	Latex outer boots		**Tyvek coveralls**	x	**Saranex coveralls**
x	**APR Respirator**		**SCBA**	x	**Hardhat**
x	**APR Cartridge:**		**Safety Glasses**		**Safety Goggles**
	Ear Protection		**Cotton Coveralls**		**Other:**
x	**Other: Hard hat splash shield**		**Other:**		**Other:**

5.6 AIR MONITORING

The following air monitoring instruments shall be used on-site at the specified intervals.

	Instrument type	Frequency
x	**ppb Rae**	constant
x	**TVA**	constant
	Detector tubes:	N/A
	Other:	N/A

Action level responses
Unknown gas/vapor PID/FID reading above background to 5 ppm: use level C protection
Unknown gas/vapor PID/FID reading 5 to 500 ppm: evacuate, allow air flow through hangar to clear area, retest, proceed when 5ppm or below
Unknown gas/vapor PID/FID reading above 500 ppm: evacuate/control the hazard
Known gas/vapor PID/FID reading greater than half the PEL: use level C protection
Known gas/vapor PID/FID reading IDLH: do not attempt collection
Other: **If any fumes are observed emanating from a sealed drum after opening, the drum will be immediately resealed.**

5.7 DECONTAMINATION PROCEDURES

Wear disposable coveralls, disposable outer booties, and disposable outer gloves. Avoid walking on, kneeling on, or sitting on contaminated surfaces. Avoid contaminating any non-disposable clothing or equipment. Any PPE utilized will be removed, bagged and left on site for subsequent proper disposal. Decon equipment includes garbage bags, "Wet Ones,"& paper towels. Don't place in a single bag any contaminated PPE, other materials or equipment that would be incompatible or react with other materials in the bag.

When possible use disposable sampling equipment. If possible, reusable, non-disposable equipment (stainless steel spoons, split spoons, measuring tape, etc) will have some initial decontamination before removal from the site. Final decontamination will occur upon return to the office. The minimum decontamination procedure for all equipment is as follows:

1. Wash with water and a nonfoaming phosphate-free laboratory detergent (e.g., Liquinox®). Use a brush if necessary to remove particulate matter.
2. Thoroughly rinse with water from a municipal system that is contaminant free.
3. Rinse with organic/analyte free water (tap water that has been treated with activated carbon and deionizing units).
4. If the sampling device is highly contaminated with organics such and oily waste, rinse thoroughly with a solvent (e.g., pesticide-grade isopropanol, or hexane). Do not use on PVC or plastic items.
5. Thoroughly rinse with organic/analyte free water, or allow equipment to dry completely.
6. Store the sampler in aluminum foil and cover with clean unused plastic until ready for use.

5.8 EMERGENCY PROCEDURES

The Health & Safety Officer shall be notified of any onsite emergencies and be responsible for ensuring that the appropriate procedures are followed.

Written Directions to Taylorville Memorial Hospital

Proceed north on South Spresser, follow the curve east onto West Spresser. Proceed east by veering slightly south onto West Park to Main Street. Turn right (north) on Main street to hospital (on the right).

Personnel Injury in the Exclusion Zone: Upon notification of an injury in the Exclusion Zone, all site personnel shall assemble at the decontamination line. The rescue team will enter the Exclusion Zone (if required) to remove the injured person to the hotline. The Site Safety Officer and Project Team Leader should evaluate the nature of the injury, and the affected person should be decontaminated to the extent possible prior to movement to the Support Zone. Appropriate first aid shall be initiated, and contact should be made for an ambulance and with the designated medical facility (if required). No persons shall reenter the Exclusion Zone until the cause of the injury or symptoms are determined.

Personnel Injury in the Support Zone: Upon notification of an injury in the Support Zone, the Project Team Leader and Site Safety Officer will assess the nature of the injury. If the cause of the injury does not affect the performance of site personnel, operations may continue, with the on-site first aid initiated and necessary follow-up as stated above. If the injury increases the risk to others, all site personnel shall move to the decontamination line for further instructions. Activities on-site will stop until the added risk is removed or minimized.

Fire/Explosion: Upon notification of a fire or explosion on-site, all site personnel shall be assembled at the decontamination line. The fire department shall be alerted and all personnel moved to a safe distance from the involved area.

Personal Protective Equipment Failure: If any site worker experiences a failure or malfunction of protective equipment that affects the protection factor, that person and his/her buddy shall immediately leave the Exclusion Zone. Reentry shall not be permitted until the equipment has been repaired or replaced.

Other Equipment Failure: If any other equipment on-site fails to operate properly, the Project Team Leader and Site Safety Officer shall be notified and then determine the effect of this failure on continuing operations on-site. If the failure affects the safety of personnel or prevents completion of the Work Plan tasks, all personnel shall leave the Exclusion Zone until the situation is evaluated and appropriate actions taken.

In all situations, when an on-site emergency results in evacuation of the Exclusion Zone, personnel shall not re-enter until:

1. The conditions resulting in the emergency have been corrected.
2. The hazards have been reassessed.
3. The Site Safety Plan has been reviewed
4. Site personnel have been briefed on any changes in the Site Safety Plan.

First-aid equipment available on-site: First-aid kit, containers of tap water.

List of emergency phone numbers

- Police: 911
- Fire: 911
- Ambulance: 911
- Hospital: 824-3339– Taylorville Memorial Hospital

5.9 CERTIFICATION

Personnel signing below certify that they understand this site safety plan.

Approved: Blaine A. Kinsley, Safety Officer 6/4/14

6-14-14

6/4/2014

AEI 6-5-14

AEI 6-5-14

6. APPENDICES

Site Specific:

1. Locator Maps for Site
2. Site Map
3. Hospital Locator Maps
4. Site Permit (if applicable)
5. Equipment and commodity list

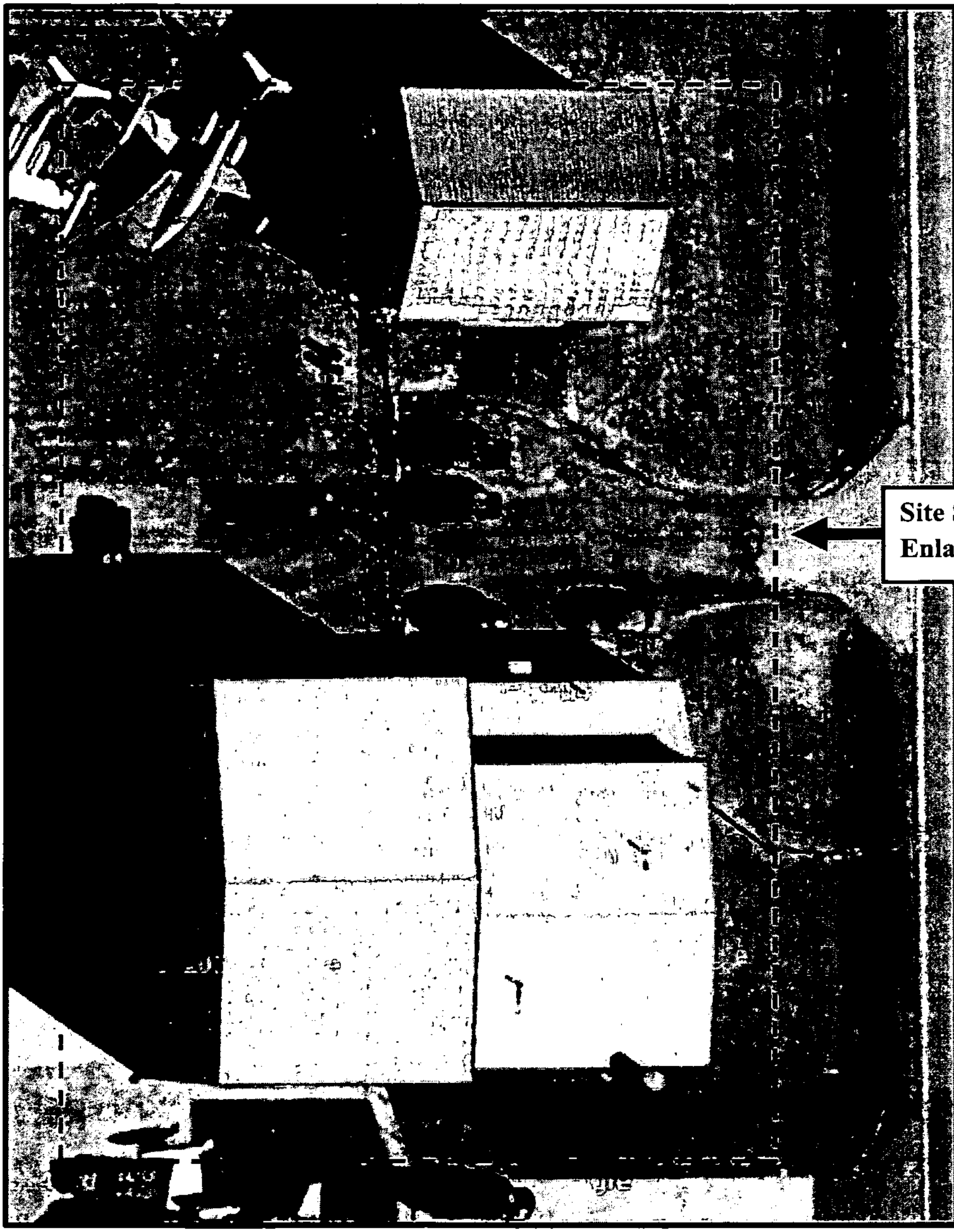
R000335

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

Aerial Image

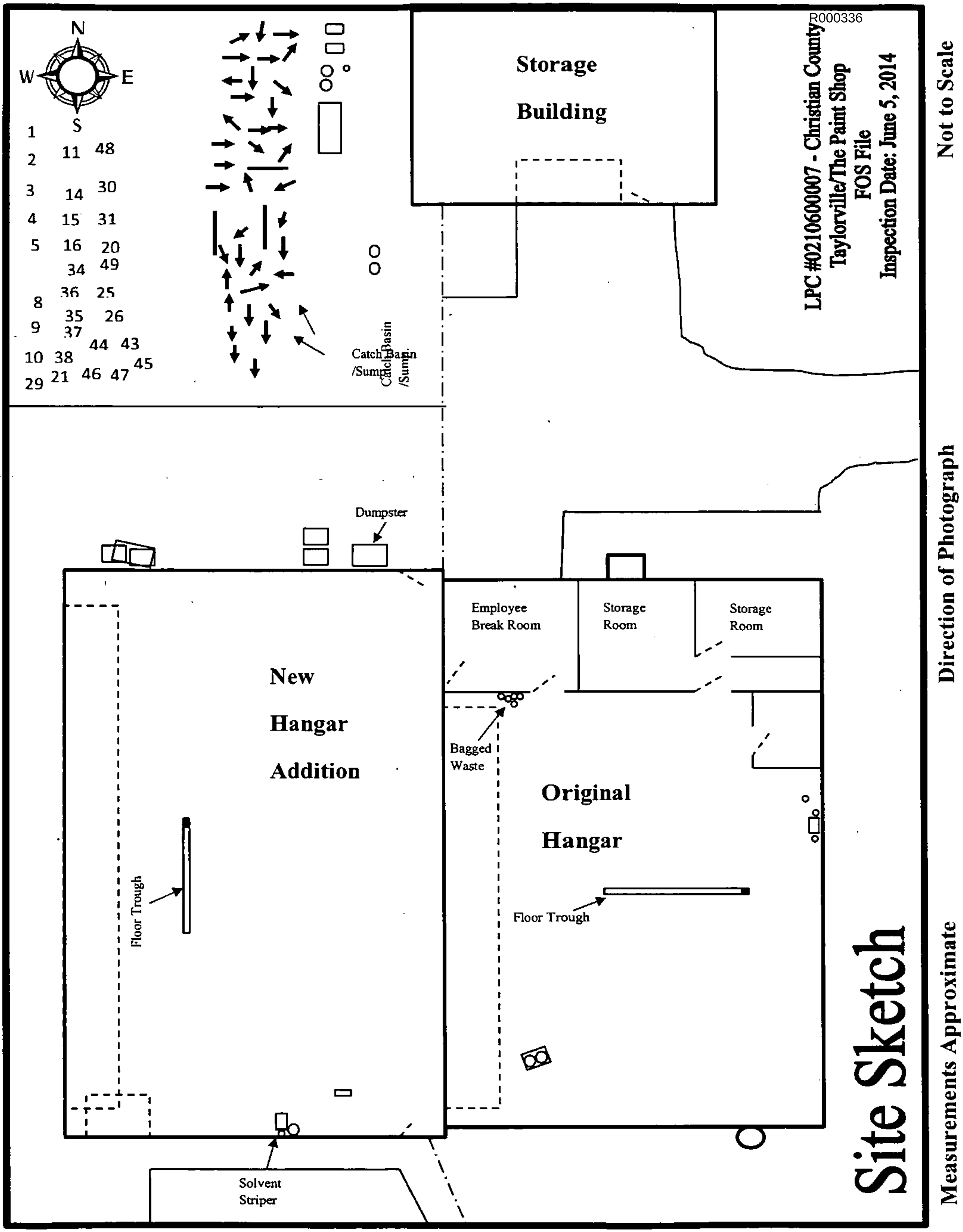
LPC #0210600007 - Christian County
Taylorville/The Paint Shop
FOS File
Inspection Date: May 16, 2014

N W E S



Site Sketch Enlargement

R000336



LPC #0210600007 - Christian County
Taylorville/The Paint Shop
FOS File
Inspection Date: June 5, 2014
Not to Scale
Direction of Photograph
Measurements Approximate
Site Sketch
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44
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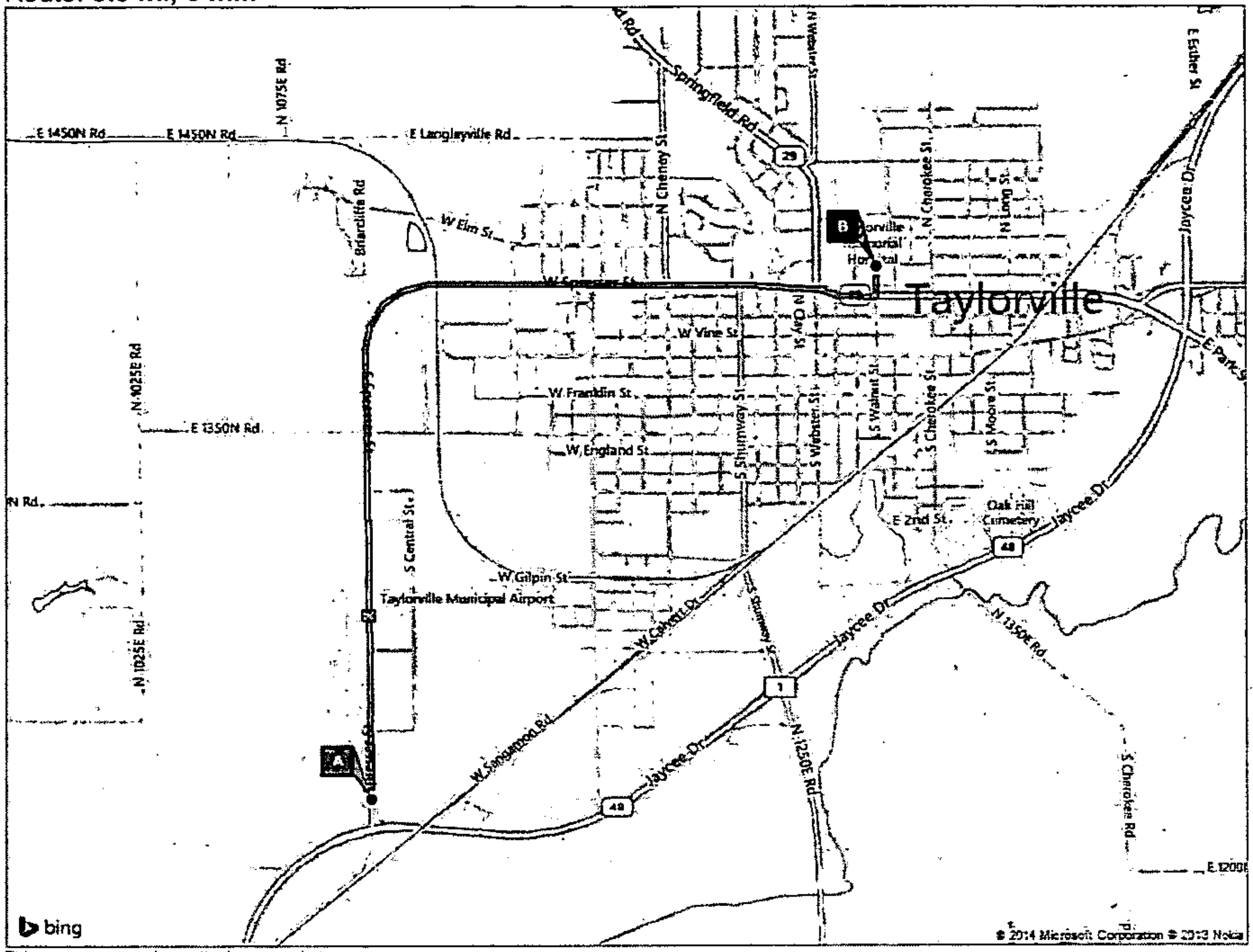
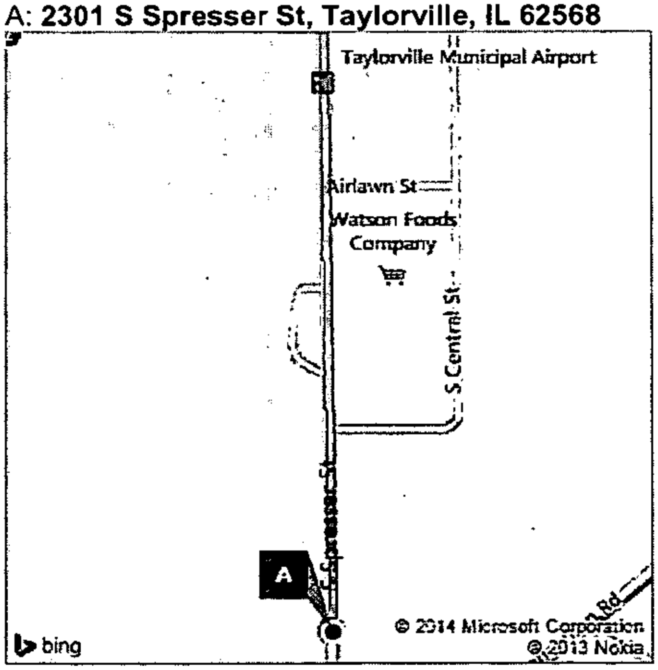
45
46
47
Catch Basin /Sump
Catch Basin /Sump
Storage Building
Dumpster
New Hangar Addition
Floor Trough
Employee Break Room
Storage Room
Storage Room
Bagged Waste
Original Hangar
Floor Trough
Solvent Striper

Route: **3.5 mi, 8 min**



This was your map view in the browser window.

A: 2301 S Spresser St, Taylorville, IL 62568



B: 201 E Pleasant St, Taylorville, IL 62568

bing Maps

A 2301 S Spresser St, Taylorville, IL 62568

B 201 E Pleasant St, Taylorville, IL 62568

Route: **3.5 mi, 8 min**

My Notes

A	**2301 S Spresser St, Taylorville, IL 62568**	**A–B: 3.5 mi** 8 min
	1. Depart **S Spresser St** toward Airlawn St	1.7 mi
	2. Keep **straight** onto **W Spresser St**	1.5 mi
	3. Keep **straight** onto **IL-29 / W Park St**	0.2 mi
	4. Turn **left** onto **N Walnut St / Walnut St**	0.1 mi
B	5. Arrive at **201 E Pleasant St, Taylorville, IL 62568** *The last intersection is E North St*	

SAMPLING EQUIPMENT CHECKLIST

PROJECT MANAGER:

- X IEPA Identification
- X Safety Training Certification
- X Lab Phone Numbers
- X Site Map & Directions
- X Chain of Custody Forms
- ___ Field Logbook
- ___ Aluminum Case (for paperwork)
- X Calculator
- X Camera & Battery
- X Pencils & Pens
- X China Markers
- ___ Compass
- X Pocket Knife
- ___ Emergency Raingear
- X PPE Gloves
- X Evidence Tape
- X Watch

PPE, SAFETY & SUPPORT:

- X Gloves: Nitrile, Latex, Butyl Rubber, or Neoprene
- X XL X L X ___ M(gloves)
- X Cleaning & Cooling Water
- ___ Hand soap
- X Drinking Water
- ___ Gatorade
- ___ Field Chairs
- ___ Insect/Tick Repellant
- X Sunscreen
- ___ Raingear
- X First Aid Kit
- X Disposable Booties
- X Fire Extinguisher (1)
- ~~Walkie Talkies~~
- X Full-Face Respirator
- X Cartridges
- ___ SCBAs
- ___ Cylinders
- X Tyvek
- X Saranex
- ___ Cotton Coveralls
- ___ Insulated Coveralls
- X Steel-Toed/Shanked Boots
- ___ Insulated Pack-Boots
- X Hardhat/Face Shields
- ___ Glove Liners
- X Telephone

FOR DECON:

Hand Spray Bottles:

- ___ Liquinox Solution
- ___ Distilled/Deionized Water
- ___ HCL: dilute to 5 or 10%
- ___ Nanopure(distilled/deionized)

5-Gallon Sprayers:

- ___ Liquinox Solution
- X Tap Water
- ___ Extra Gallons of DI Water
- ___ 5-gal. Tap water (for pump decon)
- ___ Aluminum Foil
- ___ Brushes
- X Plastic Tubs
- X Garbage Bags

FOR FIELD SCREENING:

- ___ Passport
- X PID
- X FID
- X TVA
- X CGI
- ___ DL101
- ___ Radiation Detector
- ___ Draeger Pump, Tubes

PURGING:

- ___ KEYS TO WELLS
- ___ Boltcutters, screwdriver,
- ___ Vice grip
- ___ Tool Box
- ___ Replacement Locks
- ___ Water level indicator (2)
- ___ 3 AA batteries
- ___ Paper towels
- ___ Machete
- ___ Visqueen (pre-cut)
- ___ Utility knife
- ___ Garbage bags
- ___ Purge pump & battery
- ___ Bailers
- ___ Nylon Cordage
- ___ 5-gal. Plastic purge buckets
- ___ Stainless steel Weights (For unweighted PE bailers)
- ___ Backpack frame
- ___ Fishing gear:
  - ___ Treble hooks & weights, fishing line
- ___ Bungee cords
- ___ Flashlight & batteries
- ___ Fluorescent flagging
- ___ Disposable tubing for pump

SAMPLING:

- X Sample bottles
- X Extra bottle labels
- ___ Clear waterproof tape
- X Portable Table
- X pH paper
- ___ pH/SC (or mV)/Temp meter & 9-volt battery
- ___ Umbrella
- ___ Leachate Bailers

FILTERING:

- ___ Quickfilter Transfer Vessel (2)
- ___ Hand Pumps (2)
- ___ O-rings for vessel
- ___ Silicone tubing
- ___ Disposable filter cartridges
- ___ Turbidity Meter
- ___ Peristaltic Pump
- ___ Fuses: ½ & ¼ amp
- ___ Cords: ac and lighter plug

SEALING & TRANSPORTATION:

- X Coolers
- ___ Blue Ice
- ___ Dry Ice
- X Regular Ice
- X Large Food-grade baggies
- X Quart Ziplock Bags
- ___ Bubble wrap
- X Evidence Tape
- X COC Form
- ___

OTHER GENERAL SAMPLING EQUIPMENT:

- ___ Rain Canopy & Poles
- ___ Aluminum Foil
- ___ Binoculars
- ___ Shovel
- X Trowel/Sampling Spoons
- X Duct Tape
- ___ Dry Erase Board

ATTACHMENT M

LPC # 0210600007– Christian County
Taylorville/The Paint Shop
USEPA #ILD982621690
FOS FILE

and

LPC # 0210605081– Christian County
Taylorville/Evergreen Aviation
FOS FILE

A copy of the sampling safety plan entitled "Health and Safety Plan" prepared for Brandis Aircraft, was provided by Andrews Engineering, Inc. during the June 5, 2014. This is Andrew's plan. The year on the plan was incorrectly listed as 2013. The plan includes more than 90 pages of information. IEPA personnel reviewed and signed a copy of the Andrew's plan on June 5, 2014, on-site.

Brandis Aircraft
2301 S. Spresser St.
Taylorville, IL 62568

IEPA Site ID: 0210600007

Health and Safety Plan

June 2013

EMERGENCY INFORMATION:

Police Department:	(217) 824-4961 or Emergency – 911
Fire Department:	(217) 824-2295 or Emergency – 911
Hospital:	Taylorville Memorial Hospital 201 E Pleasant St. Taylorville, IL 62568 (217) 824-3331
Poison Control:	800-222-1222 or 800-942-5969
H&S Officer:	217-787-2334 (Stephennie Brumley)

Prepared for:
Brandis Aircraft
2301 S. Spresser St.
Taylorville, Illinois

Prepared by:

ANDREWS
ENGINEERING, INC.
3300 Ginger Creek Drive
Springfield, Illinois 62711
Tel: (217) 787-2334; Fax: (217) 787-9495

Health and Safety Hazards

Brandis Aircraft

Minimum PPE

- Safety glasses with side shields
- Hard hat
- Steel toe boots
- Disposable Nitrile and Chemical-Resistant Gloves
- Chemical-Resistant (e.g., Tyvek®) Coveralls or Apron

Possible Hazards and Procedures to Mitigate:

- Vapors/Mists/Liquids
  - Air monitoring; exit immediately in event of monitor alarm
  - Know signs/symptoms of chemical exposure; monitor yourself; use a buddy system.
  - Proper PPE (chemical-resistant suit and/or apron and gloves)
- Muscle Strain (over-reaching; awkward position)
  - Utilize proper lifting procedures
  - Use assistant, if necessary
- Pinch points
  - Use caution when opening/closing containers
  - Keep hands free from pinch points
- Slips, trips, and falls
  - Awareness of surroundings
  - Practice proper housekeeping
  - Use proper footwear
- Heat Stress
  - Know signs/symptoms of heat stress; monitor yourself; use a buddy system.
  - Drink plenty of fluids (i.e., water and Gatorade®-type drinks)
  - Take breaks as needed

BRANDIS WASTE CHARACTERIZATION SAMPLING JOB HAZARD ANALYSIS

REQUIRED PERSONAL PROTECTIVE EQUIPMENT:

X	Safety Glasses	X	Head Protection (i.e., hard hat)		Hearing Protection
	Safety Goggles	X	Gloves (chemical resistant)	X	Other: Chemical-Resistant Coveralls or Apron
X	Steel Toe Shoes		Electrical Gloves		

ACTIVITY PHASE	POTENTIAL HAZARDS	CONTROL MEASURES
Set up equipment	Slips, trips, falls	Awareness of surroundings; watch where walking; proper housekeeping; proper footwear PPE; safe work practices
	Cuts and/or lacerations from broken bottles	Inspect container contents before putting hands in container; safe work practices
	Pinch Points	Use caution when opening/closing containers; keep hands free from pinch points; safe work practices
	Muscle strain	Proper lifting procedures/awkward position; use proper lifting procedures; use assistant, if needed; safe work practices
	Chemical/contaminated liquid exposure (splash or spill)	Proper PPE (disposable gloves, chemical-resistant coveralls or apron); safe work practices
Sampling	Slips, trips, falls	Awareness of surroundings; watch where walking; proper housekeeping; proper footwear PPE; safe work practices
	Muscle strain	Proper lifting procedures/awkward position; use proper lifting procedures; use assistant, if needed; safe work practices
	Chemical/contaminated liquid exposure (splash or spill)	Proper PPE (disposable nitrile and chemical-resistant gloves, chemical-resistant coveralls or apron); safe work practices
	Cuts and/or lacerations from broken bottles	Inspect container contents before putting hands in container; safe work practices
	Pinch Points	Use caution when opening/closing containers; keep hands free from pinch points; safe work practices
	Vapors/mists	Practice safe work practices; air monitoring; proper PPE (e.g., respirator if air monitoring requires)
Misc. – These hazard types may be found in some or all of the operations listed above	Environmental – heat/cold stress, dust	Utilize safe work practices, training, and PPE. Take breaks as necessary and drink plenty of fluids (i.e., water and/or Gaterade® -type drinks)

[redacted]

TABLE OF CONTENTS

FIGURES

ATTACHMENTS

1. INTRODUCTION

This site-specific Health and Safety Plan (H&S Plan), based upon Andrews Engineering, Inc.'s (Andrews Engineering) Corporate H&S Plan, outlines health and safety procedures and protocol. These are to be followed during RCRA waste characterization sampling activities at the Brandis Aircraft facility located in Taylorville, Illinois. Known chemical and physical hazards associated with the jobsite tasks are identified herein.

This Plan should not be interpreted as a static document. Changes in working conditions, potential site hazards, or project scope will warrant appropriate addenda as work progresses

All fieldwork conducted by Andrews Engineering and its subcontractors will be performed in accordance with the Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.120, which regulates "Hazardous Waste Operations and Emergency Response."

1.1 Site History

Andrews Engineering was contracted by Brandis Aircraft to perform RCRA waste characterization sampling at their facility located at 2301 South Spresser Street in Taylorville, Christian County, Illinois (see Figure 1, Site Location Map). Brandis Aircraft provides Aircraft Engine Servicing and Maintenance services, which includes stripping and painting, and has been in business since 1955.

The Illinois Environmental Protection Agency (Illinois EPA) will be onsite during sampling procedures.

2. JOBSITE INFORMATION

2.1 Team Organization

The key Andrews Engineering personnel for this project are:

- Project Manager (PM) – Kenneth Liss
- Health and Safety Manager (HSM) – Stephennie Brumley
- Site Safety Officer (SSO) – James Stufflebeam

The HSM will approve all health and safety decisions regarding site work, determine levels of personal protective equipment (PPE), required for site tasks, and audit health and safety procedures.

The SSO will conduct air monitoring, advise site personnel on safety issues, and hold and document the required health and safety meetings. The assigned Site Supervisor (SS) will supervise and delegate duties to all site personnel and direct site operations. For this particular project the job of the SSO and the SS will be performed by the same person.

2.2 Scope of Work

Andrews Engineering will perform sampling of liquid and solid contents currently being stored in barrels, troughs, and garbage bags. In addition, material will be sampled from waste plastic sheeting. The purpose is to characterize the potential RCRA-related hazards associated with the waste products.

This sampling is being conducted due to an Illinois EPA inspection. The Illinois EPA will be present for this event to split samples.

2.3 Site Control/Security

No one will be allowed to enter the job site area without the proper training and PPE. Visitors must comply with all aspects of this H&S Plan.

2.4 Mobilization/Demobilization

Mobilization and demobilization represent limited pre- and post-task activities. These activities include driving to and from the site, initial site preparation (e.g., equipment setup), and post-work activities (e.g., job-related paperwork, equipment breakdown).

2.5 Site Preparation

Sampling procedures will be conducted inside the Brandis Aircraft facility. The Illinois EPA will be onsite and will conduct air monitoring before personnel are allowed to enter the facility. Upon Illinois EPA determination that the building is safe to enter, the building doors will be maintained open for ventilatation and jobsite personnel will enter to collect the required number of samples from the waste containers.

2.6 RCRA Waste Characterization Sampling Procedures

An estimated ten samples, eight liquid (utilizing disposable drum samplers from barrels and troughs) and two solid (scrape or cut from garbage bags and plastic sheeting) will be collected. The samples will be placed in the appropriated lab-issued bottles and immediately packaged for shipment to the laboratory following preservation and management protocols. (See Attachment 4 for Andrews Engineering Sampling Standard Operating Procedures.)

2.7 Equipment Decontamination

Pre-cleaned and dedicated sampling materials/equipment will be used for sample collection. After collection, any disposable or one-time use equipment will be placed in a plastic bag for disposal in accordance with regulatory guidelines. Non-disposable equipment that came into contact with the sampling media will be decontaminated between each sampling location (utilizing deionized water and an Alconox solution).

2.8 Emergency Equipment and Procedures

Emergency exit routes, notification procedures, and proper use of emergency equipment will be clearly defined for all personnel during the initial safety meeting conducted by the SS/SSO.

Andrews Engineering employees who perform site-specific work assignments have received 40-hour HAZWOPER training. They are also trained in First Aid/CPR. All personnel will be prepared to provide assistance in case the need arises.

A listing of emergency phone numbers can be found in Attachment 1. Emergency equipment maintained at the job site includes a first-aid kit (meeting the requirements of 29 CFR 1926.50

and ANSI Z308.1-2009), fire extinguisher, and emergency eye wash kit. A vehicle will always be located at the work site to provide transportation to a hospital if needed (see Figure 2 for a Hospital Location Map). All personnel will know the location of all emergency equipment prior to the commencement of site activities. A copy of the H&S Plan will be easily accessible by all personnel at the jobsite.

Should a member of the site personnel be injured, become ill, or be chemically exposed, the following steps will be taken:

- Local emergency services will be called, if necessary. (If necessary, the site personnel member will be gross decontaminated.)
- The site personnel member's PPE will be removed.
- The Safety Data Sheets (SDS) contained in Attachment 2 will be referred to for information.
- The responding paramedic, emergency response unit, or designated member will transport the injured to the nearest hospital. In the case of the use of a paramedic squad, a site personnel member will accompany the injured person to the hospital in order to provide accident information to the emergency room attendant and later to Andrews Engineering's HSM.
- The incident will be recorded in the site safety and the site field logbooks and a written accident/incident will be filed with the HSM and maintained in the project file upon completion of the project.

3. HAZARD ASSESSMENT

3.1 Hazard Assessment

The following physical and/or chemical hazards are anticipated during performance of jobsite sampling procedures. See the Job Hazard Analysis (at the front of this document) for detailed analysis of hazards.

The purpose of this assessment is to identify known potential conditions or activities that may pose routine occupational hazards or immediate danger to life or health of site personnel. This assessment also provides information for selection and application of PPE and environmental monitoring methods.

3.1.1 Physical Hazards

Site personnel are to be aware of potentially dangerous situations that may arise during site activities. These include, but are not limited to:

- Slips, Trips, and Falls. A variety of conditions may exist that could result in injury from slips, trips and falls. Wet, slippery, or uneven walking surfaces pose a potential risk. To prevent injury, proper housekeeping procedures should be followed as well as use of proper footwear.
- Manual Lifting. Most materials associated with the jobsite tasks are moved by hand. The human body may sustain injury in the form of back injury, muscle strains, and hernia if

caution is not observed in the handling process. Proper lifting procedures should be observed (i.e., lift with your knees); if necessary, use two people to lift a load.

- Spill Prevention. Work activities have the potential for contact with hazardous materials (e.g., methylene chloride, methyl ethyl ketone [MEK], toluene [see Attachment 2 for relevant SDSs]). The following procedures will be used to prevent or contain spills:
  - All hazardous material will be stored in appropriate containers
  - Tops/lids will be replaced on containers after use
  - Containers of hazardous materials will be stored appropriately
- Heat Stress. Heat stress may cause personnel to faint. If a person is feeling dizzy, tired, or nauseated, they should rest. During rest periods, site personnel should drink plenty of fluids (water or Gatorade®).and their temperature and pulse rate may be taken.
- Fire or Explosion. No open flame, sparking electrical equipment or other ignition sources will be used during sampling activities or in proximity of sampling media. Smoking is allowed only in designated areas.

3.1.2 Chemical Hazards

Chemical exposure is a concern during sampling activities. Potential contaminants include methylene chloride, MEK, toluene (see Attachment 2 for relevant SDSs). Flammable, toxicity/health (inhalation and ingestion), and corrosive hazards are associated with the sampling media. To mitigate these risks, the following procedures shall be observed:

- Air monitoring and building ventilation
- Proper use of Personal Protective Equipment (PPE)
- Avoiding direct contact with contaminated media
- Washing hands prior to eating or using tobacco products

4. HEALTH AND SAFETY REQUIREMENTS

4.1 Comprehensive Health and Safety Training

Prior to conducting fieldwork, Andrews Engineering field personnel will have been formally trained in accordance with 29 CFR 1910.120 (HAZWOPER). If required for work activities, they will be properly respirator fit-tested in accordance with 29 CFR 1910.134 and take and pass a physical examination.

The SS/SSO will have had previous field experience and will be familiar with the type of work being performed. Andrews Engineering personnel will understand the scope of work and specific activities, including their responsibilities, site hazards, required equipment, and procedures to be followed.

Personnel will be required to read and follow all procedures contained in this H&S Plan. Any variance must be approved by the HSM. At no time will personnel who lack proper training be allowed on site.

4.2 Pre-investigation and Morning Meeting Health and Safety Briefing

Prior to the initiation of site activities, all site personnel will have access to and be required to read the H&S Plan. The SS/SSO will brief the field team on safety hazards and procedures. The initial briefing will thoroughly inform site personnel and subcontractors of all site activities. In addition to the briefing, a morning safety meeting will be held daily to define work objectives for the day and any modifications to the H&S Plan. These meetings will be documented using the Safety Meeting Record Form contained in Attachment 3.

4.3 Exposure Monitoring

The following is a discussion of potential hazards presented to site personnel during jobsite activities. Continuous air monitoring, through the use of a PID or similar type of equipment, will occur to ensure employees are not exposed to contaminants above the action level. In the event of a monitor alarm, jobsite personnel will immediately exit the building.

4.3.1 Methyl Ethyl Ketone (MEK)

CAS No.: 78-93-3
Permissible Exposure Limit: 8-hour TWA – 220 ppm; STEL – 300 ppm

MEK is a highly flammable liquid or vapor that presents serious health risks. Exposure routes include inhalation, ingestion, skin and/or eye contact. All sources of ignition should be removed. Exposure controls include room ventilation and proper PPE. See the SDS in Attachment 2 for further information.

4.3.2 Methylene Chloride

CAS No.: 75-09-2
Permissible Exposure Limit: 8-hour TWA – 25 ppm; STEL – 125 ppm

Methylene Chloride presents serious health risks. It affects the central nervous system, liver, cardiovascular system, and blood. It is a suspected cancer hazard. Exposure routes include inhalation, ingestion, skin and/or eye contact. Exposure controls include room ventilation and proper PPE. See the SDS in Attachment 2 for further information.

4.3.3 Toluene

CAS No.: 108-88-3
Permissible Exposure Limit: 8-hour TWA – 100 ppm; STEL – 150 ppm

Toluene is a highly flammable liquid or vapor that presents serious health risks. It is insoluble in water; hence if floats on water. Exposure routes include inhalation, ingestion, skin and/or eye contact. All sources of ignition should be removed. Vapor is heavier than air and may travel a considerable distance to a source of ignition and flash back. Exposure controls include room ventilation and proper PPE. See the SDS in Attachment 2 for further information.

4.4 Personal Protective Equipment

Initially, the job site area will be considered a Modified Level D (general work clothes with hard hat, safety glasses with side shields, disposable nitrile and chemical-resistant gloves, chemical-resistant coveralls or apron, steel-toe boots/shoes) protection zone. If organic vapor levels exceed 1 ppm and are less than 5 ppm, PPE will be upgraded to Level C (Tyvek suit with air purifying respirator [APR]) protection). If the organic vapor level remains at 0 to 1 ppm above background (in the breathing zone) and oxygen levels are between 19.5 and 25.0 percent, the level of PPE will be maintained at Modified Level D. No work will be conducted in the areas where oxygen levels exceed 25.0 percent because of the increased potential for explosion, in areas where the oxygen levels may fall below a health-supportive level of 19.5 percent or in areas where the Lower Explosive Limit (LEL) exceeds 10 percent

Modified Level D PPE will be utilized as general practice if continuous air monitoring indicates a safe environment. If instrument readings indicate the need to upgrade, site personnel will exit the work area and re-enter in Level C. Andrews Engineering does not anticipate the use of PPE above Level C. However, the following summary of each level is included:

Recommended Equipment for Level D Protection:

- Hard hat
- Steel-toe boots/shoes
- Gloves
- Safety glasses or chemical splash goggles

Optional Equipment of Level D Protection:

- Escape mask
- Face shield

Recommended Equipment for Level C Protection:

- Full face, air purifying, canister equipped respirator
- Chemical-resistant clothing (overalls and long sleeve jacket, hooded one- or two-piece chemical splash suit, disposable chemical-resistant one-piece splash suit)
- Inner and outer chemical resistant gloves
- Chemical-resistant safety boots/shoes
- Hard hat

Optional Equipment for Level C Protection:

- Two-way radio communication
- Coveralls
- Disposable boot covers
- Face shield
- Long cotton underwear
- Escape mask

Recommended Equipment for Level B Protection:

- Pressure demand, full face SCBA or pressure demand SAR with escape SCBA
- Chemical-resistant clothing (overalls and long sleeve jacket; one- or two-piece chemical splash suit; disposable chemical-resistant one-piece suit)
- Inner and outer chemical resistant gloves

- Chemical-resistant safety boots/shoes
- Hard hat
- Two-way radio communication

Optional Equipment for Level B Protection

- Coveralls
- Disposable boot covers
- Face Shield
- Long cotton underwear

Recommended Equipment for Level A Protection:

- Pressure demand, full face piece self-contained breathing apparatus (SCBA) or pressure demand supplied air respirator (SAR) with escape SCBA
- Fully encapsulating chemical resistant suit
- Inner chemical-resistant gloves
- Chemical-resistant safety boots/shoes
- Hard hat
- Two-way radio communication

Optional Equipment for Level A Protection:

- Cooling unit
- Coveralls
- Long cotton underwear
- Disposable boot and glove covers

Proper use of PPE should provide effective protection; however, if an employee of Andrews Engineering or one of the subcontractors feels their health has been affected, they will be medically examined to determine whether they have been exposed. If PPE becomes grossly contaminated, the affected site personnel member will undergo decontamination before redressing in clean PPE. The incident shall be recorded on the Accident Investigation Form.

4.5 Documentation

All site activities will be documented by the SS/SSO in the site field book. The site field book also serves to record additional information regarding site conditions, selection of PPE, subcontractor supervision, and environmental monitoring and data obtained. It will become part of the permanent site record. Site entrance and exit times for all non-Andrews Engineering personnel will be indicated in the field logbook.

4.6 Drug Free Workplace Policy

Andrews Engineering has a long standing commitment to maintain the highest standards for employee health and safety and to help prevent accidents/injuries resulting from the misuse of drug and/or alcohol by employees who perform covered functions.

The unlawful manufacture, distribution, dispensation, possession or use of a controlled substance or alcohol is prohibited on all Andrews Engineering premises, in any company-owned vehicle, or other location where an employee may have a job assignment.

Violation of Andrews Engineering's drug free workplace policy shall result in disciplinary action, up to and including termination of employment, and/or the requirement that the employee satisfactorily participate in a drug abuse assistance or rehabilitation program as a condition of continued employment.

4.7 Site Communication

Site personnel will be in ongoing communication with the SS/SSO. In addition, the SS/SSO will maintain a direct line of sight with all work crew members at all possible times. If an emergency situation arises, the SS/SSO will instruct site personnel and contact the agency and/or authorities required to mitigate the situation while medical personnel are contacted. All site personnel will be informed of the evacuation route, nearest phone, and list of emergency phone numbers contained in Attachment 1.

All authorized observers and onsite agency representatives will be required to comply with the Andrews Engineering H&S Plan. Andrews Engineering will not provide PPE to site visitors. If there is a failure to follow the H&S Plan, all pertinent details of the incident will be documented in the site logbook.

4.8 Subcontractors

All Andrews Engineering subcontractors will be fully trained and qualified for hazardous waste site fieldwork. Subcontractor personnel are required to comply with 29 CFR 1910.120 and 1910.134. Proof of training will be required prior to site activities. All Andrews Engineering subcontractors will adhere to Andrews Engineering health and safety programs as stated in the H&S Plan.

NOTES:
1. BASE IMAGE DERIVED FROM GOOGLE MAPS.

N

1000 0 1000 2000 4000

SCALE: IN FEET

PROJECT LOCATION

ANDREWS ENGINEERING, INC.
3300 Ginger Creek Drive, Springfield, IL 62711-7233
Tel (217) 787-2334 Fax (217) 787-9495
Pontiac, IL • Naperville, IL • Indianapolis, IN • Warrenton, MO
Professional Design Engineering and Land Surveying Firm #184-001541

APPROVED BY: ENR | DESIGNED BY: ENR | DRAWN BY: WCU

PROJECT LOCATION MAP

PLANS PREPARED FOR

BRANDIS AIRCRAFT

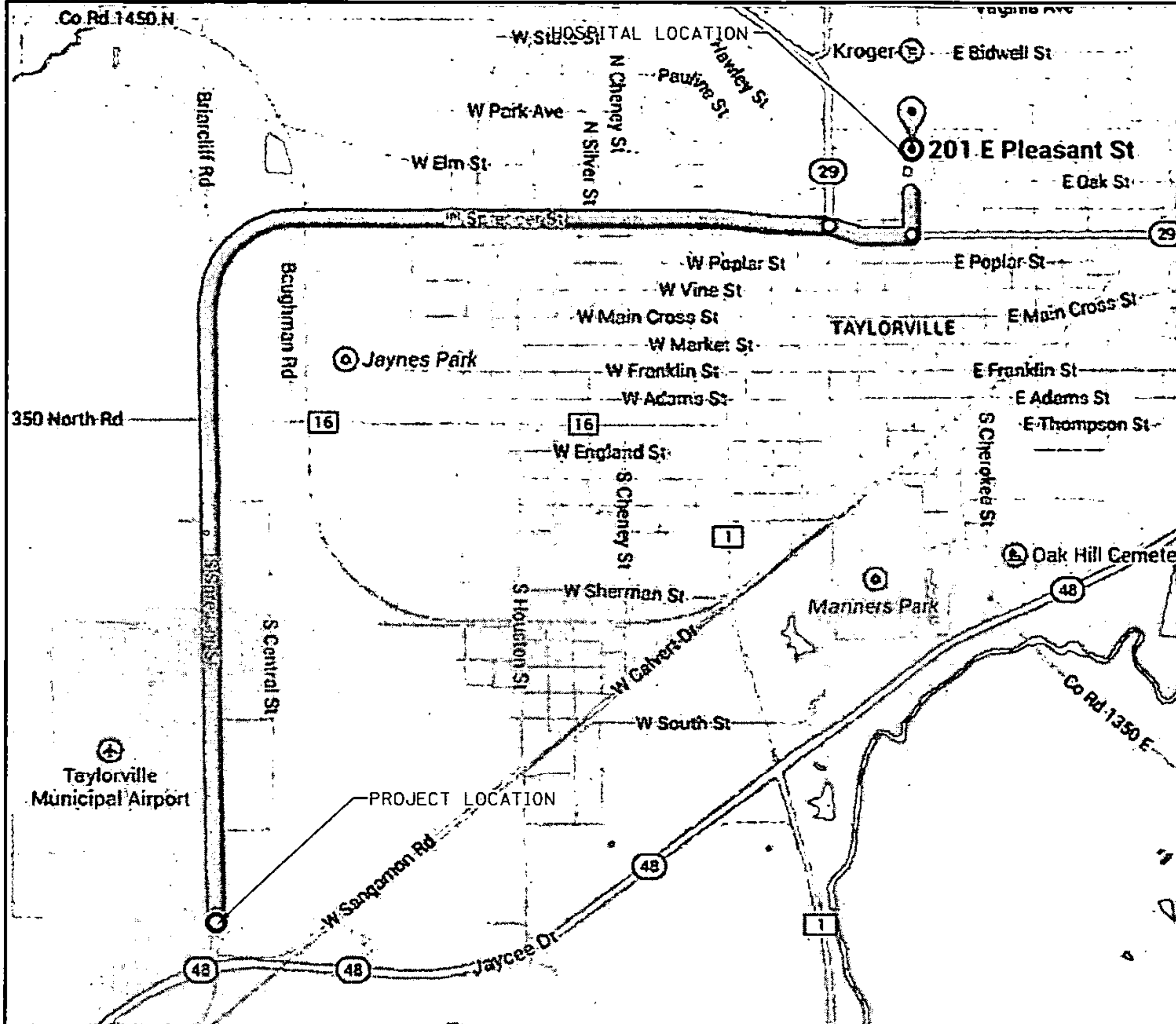
TAYLORVILLE, CHRISTIAN COUNTY, ILLINOIS

DATE: JUNE 2014

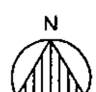
PROJECT ID: 2014-125

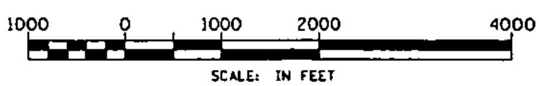
SHEET NUMBER:

FIG. 1



NOTES:
1. BASE IMAGE DERIVED FROM GOOGLE MAPS.





PROJECT LOCATION

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Professional Design Engineering and Land Surveying Firm #184-001541

APPROVED BY: ENR	DESIGNED BY: ENR	DRAWN BY: WCU

HOSPITAL LOCATION MAP

PLANS PREPARED FOR

BRANDIS AIRCRAFT

TAYLORVILLE, CHRISTIAN COUNTY, ILLINOIS

DATE:	JUNE 2014
PROJECT ID:	2014-125
SHEET NUMBER:	FIG. 2

Attachment 1:

Emergency Phone Numbers

EMERGENCY PHONE NUMBERS

PROJECT NAME:	RCRA Waste Characterization Sampling
PROJECT NO.:	2014-125
PROJECT LOCATION:	Brandis Aircraft 2301 S. Spresser St. Taylorville, Christian County, Illinois
CLIENT CONTACT:	Michael Brandis, – (217) 824-8032
IEPA CONTACT:	Paul Eisenbrandt, Field Investigator – (217) 557-8761
PROJECT MANAGER:	Kenneth Liss
SITE HEALTH & SAFETY OFFICER:	James Stufflebeam
Police Department:	Christian County Sheriff's Office 301 W Franklin St. Taylorville, IL 62568 (217) 824-4961 Emergency – 911
Fire Department:	Taylorville Fire Department 202 N Main St. Taylorville, IL 62568 (217) 824-2295 Emergency – 911
Hospital:	Taylorville Memorial Hospital 201 E Pleasant St. Taylorville, IL 62568 (217) 824-3331
Ambulance Service:	Taylorville Fire Department 202 N Main St. Taylorville, IL 62568 (217) 824-2295 Emergency – 911
Poison Control:	800-222-1222 or 800-942-5969
JULIE No.:	800-892-0123
IEMA:	800-782-7860

Attachment 2:

Material Safety Data Sheets

Methyl Ethyl Ketone (MEK)

PHARMCO-AAPER
THE POWER OF THREE[3]

Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA) +1.703.527.3887 (INT)

MATERIAL SAFETY DATA SHEET

Methyl Ethyl Ketone (MEK) 2-Butanone

This MSDS is valid for all grades and catalog #'s beginning with 354

1. IDENTIFICATION OF SUBSTANCE / MIXTURE AND OF SUPPLIER

Product Identifier:	High Purity Chemicals
Synonyms:	2-Butanone; Ethyl Methyl Ketone; MEK; Methyl Acetone
Other means of identification:	CAS No. 78-93-3 EINECS No. 201-159-0

Recommended use of the chemical and restrictions on use:

Supplier Details:

Pharmco Products, Inc. 58 Vale Road, Brookfield, CT 06804, USA. Tel: 203.740.3471 Fax: 203.740.3481 CCN17213	**Pharmco Products, Inc.** 1101 Isaac Shelby Drive, Shelbyville, KY 40065, USA. Tel: 502.232.7600 Fax: 502.633.6100 CCN17213

Emergency Contact: **CHEMTREC: 1.800.424.9300 (USA) / +1.703.527.3887 (International)**

2. HAZARDS IDENTIFICATION

OSHA Hazards:

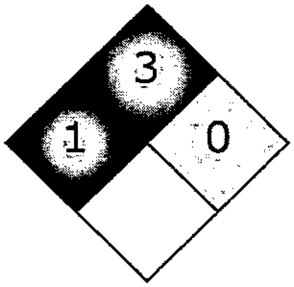
Flammable liquid, Irritant, Target organ effect

Target Organs:

Central nervous system

Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA)
+1.703.527.3887 (INT)

NFPA



GHS label elements, including precautionary statements

Signal Word:
DANGER!

Hazard statement(s)

H225	Highly flammable liquid and vapor.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.

Precautionary statement(s)

P261	Avoid breathing dust/fumes/gas/mist/vapors.
P312	Call a POISON CENTER or doctor/ physician if you feel unwell.
P501	Dispose of contents and container to an approved waste disposal plant.
P240	Ground/bond container and receiving equipment.
P337 + P313	If eye irritation persists: Get medical attention.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical attention.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P303 + P361 + P353	IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P210	Keep away from heat, sparks, open flames, and hot surfaces. No

	smoking.
P233	Keep container tightly closed.
P102	Keep out of reach of children.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P243	Take precautionary measures against static discharge.
P241	Use explosion-proof electrical, ventilating, and lighting equipment.
P242	Use only non-sparking tools.
P271	Use only outdoors or in a well-ventilated area.
P264	Wash hands thoroughly after handling.
P280	Wear protective gloves and eye and face protection.

GHS Classification(s)
Eye Irritation (Category 2)
Flammable Liquids (Category 2)
Specific target organ toxicity - single exposure (Category 3)

Other hazards which do not result in classification:

Potential Health Effects:

Organ	Description
Eyes	Causes eye irritation.
Ingestion	May be harmful if swallowed.
Inhalation	May be harmful if inhaled. Causes respiratory tract irritation. Vapors may cause drowsiness and dizziness.
Skin	May be harmful if absorbed through skin. Causes skin irritation.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Chemical identity:	Methyl Ethyl Ketone
Common name / Synonym:	2-Butanone; Ethyl Methyl Ketone; MEK; Methyl Acetone
CAS number:	78-93-3
EINECS number:	201-159-0
ICSC number:	0179
RTECS #:	EL6475000
UN #:	UN1193
EC #:	606-002-00-3

% Weight	Material	CAS
100	Methyl Ethyl Ketone	78-93-3

PHARMCO-AAPER
THE POWER OF THREE³

Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA) +1.703.527.3887 (INT)

4. FIRST AID MEASURES

General advice

Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

Skin

Wash skin with soap and copious amounts of water. Seek medical attention.

Inhalation

Remove person to fresh air. If signs/symptoms continue, get medical attention. Give oxygen or artificial respiration as needed.

Eyes

Thoroughly flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation persists, seek medical attention.

Ingestion

DO NOT induce vomiting. If vomiting does occur, have victim lean forward to prevent aspiration. Rinse mouth with water. Seek medical attention. Never give andything my mouth to an unconcious individual.

---

5. FIRE FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media:

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products):

Carbon oxides expected to be the primary hazardous combustion product.

Special protective equipment and precautions for firefighters:

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Keep unopened containers cool by spraying with water.

Flammable Properties
Classification
OSHA/NFPA Class IB Flammable Liquid.
Flash point
-9 °C (16 °F) - Closed Cup
Autoignition temperature
404 °C (759 °F)

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6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Do not inhale vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

Environmental precautions:
Stop leak / contain spill if possible and safe to do so. Prevent product from entering drains.

Methods and materials for containment and cleaning up:
Contain spill, then collect with an electrically protected vacuum cleaner or by wet-brushing and put the material into a convenient waste disposal container. Keep container closed.

7. HANDLING AND STORAGE

Precautions for safe handling:
Do not get on skin or in eyes. Do not inhale vapor or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the buildup of electrostatic charge.

Conditions for safe storage, including any incompatibilites:
Keep container tightly closed in a cool, dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Avoid moisture.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters, e.g., occupational exposure limit values or biological limit values:

Occupational Exposure Limits

Component	Source	Type	Value	Note
Methyl Ethyl Ketone	US (ACGIH)	TWA	200 ppm	
Methyl Ethyl Ketone	US (ACGIH)	STEL	300 ppm	

Appropriate engineering controls:
General room or local exhaust ventilation is usually required to meet exposure limit(s). Electrical equipment should be grounded and conform to applicable electrical code.

Individual protection measures, such as personal protective equipment:

Respiratory protection:
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection:
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching

glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Use equipment approved by appropriate government standards, such as NIOSH (US) or EN166 (EU) Maintain eye wash fountain and quick-drench facilities in work area.

Skin and body protection:
Wear impervious, flame retardant, antistatic protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Hygiene measures:
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance *(physical state, color, etc.)*	Liquid. Colorless, clear.
Freezing point	-87 °C (-125 °F)
Initial boiling point and boiling range	80 °C (176 °F)
Flash point	-9 °C (16 °F) - Closed Cup
Upper / Lower flammability or explosive limits	1.8 %(V) / 10.1 %(V)
Vapor pressure	95 hPa (71 mmHg) at 20 °C (68 °F)
Vapor Density	2.5
Relative Density	0.805 g/mL at 25 °C (77 °F)
Solubility(ies)	soluble
Auto-ignition temperature	404 °C (759 °F)
Formula (METHYL ETHYL KETONE)	C_4H_8O
Molecular Weight (METHYL ETHYL KETONE)	72.11 g/mol

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	Vapors may form explosive mixture with air.
Conditions to avoid (e.g., static discharge, shock or vibration)	Heat, flames and sparks. Extreme temperatures and direct sunlight.
Incompatible materials	Strong oxidizing agents, strong reducing agents
Hazardous decomposition products	Hazardous decomposition products formed under fire conditions. - Carbon oxides

11. TOXICOLOGICAL INFORMATION

PHARMCO-AAPER
THE POWER OF THREE^3

Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA) +1.703.527.3887 (INT)

• Methyl Ethyl Ketone 78-93-3

Product Summary:
No data available for the mutagenic, teratogenic, or reproductive effects of the product.

Acute Toxicity:

LC50 (Inhalation)	Rat	23500 mg/m3	8 hours
LD50 (Oral)	Rat	2737 mg/Kg	
LD50 (Skin)	Rabbit	6480 mg/kg	

Irritation:

Eyes
Causes eye irritation.

Skin (METHYL ETHYL KETONE)
Draize test, rabbit, skin: 500 mg/24H; Moderate skin irritation.

Carcinogenicity
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Other Hazards

Organ	Description
Eyes	Irritating to the eyes. May result in corneal injury.
Ingestion	May cause irritation of the digestive tract. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure.
Inhalation	Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. Irritation may lead to chemical pneumonitis and pulmonary edema. May cause numbness in the extremities.
Skin	May be absorbed through the skin in harmful amounts. Prolonged and/or repeated contact may cause irritation and/or dermatitis.
Chronic	Chronic inhalation may cause effects similar to those of acute inhalation. Prolonged or repeated skin contact may cause defatting and dermatitis. Animal studies have reported that fetal effects/abnormalities may occur when maternal toxicity is seen.

PHARMCO-AAPER
THE POWER OF THREE³

Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA) +1.703.527.3887 (INT)

12. ECOLOGICAL INFORMATION

- Methyl Ethyl Ketone 78-93-3

Ecotoxicity (aquatic and terrestrial, where available):
Acute Fish Toxicity (METHYL ETHYL KETONE)
LC50 / 96 hours Fathead Minnow 3220 mg/L

Toxicity to Microorganisms (METHYL ETHYL KETONE)
EC50 / 30 min Phytobacterium phosphoreum 3373 mg/L

Persistence and degradability:
No data available

Bioaccumulative potential:
No data available

13. DISPOSAL CONSIDERATIONS

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging:

Vapors may collect in empty containers. Treat empty containers as hazardous. Dispose of spill-clean up and other wastes in accordance with federal, state, and local regulations.

14. TRANSPORT INFORMATION

Description of waste residues and information on their safe handling and methods of disposal:

UN number	UN1193
UN proper shipping name	Methyl ethyl ketone
Transport hazard class(es)	3
Packing group *(if applicable)*	II

Reportable Quantity
5,000 lbs
IMDG
UN-Number: UN1193 Class: 3 Packing Group: II
EMS-No: F-E, S-D
Proper shipping name: METHYL ETHYL KETONE
Marine pollutant: No

IATA
UN-Number: UN1193 Class: 3 Packing Group: II
Proper shipping name: Methyl ethyl ketone

15. REGULATORY INFORMATION

Safety, health and environmental regulations specific for the product in question:

OSHA Hazards
Flammable liquid, Irritant, Target organ effect

All ingredients are on the following inventories or are exempted from listing

Country	Notification
Australia	AICS
Canada	DSL
China	IECS
European Union	EINECS
Japan	ENCS/ISHL
Korea	ECL
New Zealand	NZIoC
Philippines	PICCS
United States of America	TSCA

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard
Chronic Health Hazard
Fire Hazard

CERCLA
Methyl Ethyl Ketone CAS-No. 78-93-3, RQ: 5,000 lbs

Massachusetts Right To Know Components
Methyl ethyl ketone CAS-No. 78-93-3 Revision Date 2007-03-01

Pennsylvania Right To Know Components

Methyl ethyl ketone CAS-No. 78-93-3 Revision Date 2007-03-01

New Jersey Right To Know Components
Methyl ethyl ketone CAS-No. 78-93-3 Revision Date 2007-03-01

California Prop 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION:
INCLUDING INFORMATION ON PREPARATION AND REVISION OF THE SDS

Disclaimer
PHARMCO-AAPER believes that the information on this MSDS was obtained from reliable sources. However, the information is provided without any warranty, expressed or implied, regarding its correctness. Some information presented and conclusions drawn herein are from sources other than direct test data on the substance itself. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, PHARMCO-AAPER does not assume responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with handling, storage, use, or disposal of this product. If the product is used as a component in another product, this MSDS information may not be applicable. Information is correct to the best of our knowledge at the date of the MSDS publication.

Methylene Chloride

SAFETY DATA SHEET

TEDIA®
High Purity Solvents

1000 Tedia Way
Fairfield, Ohio 45014
USA
Email: tedia@tedia.com
Web: www.tedia.com

24-Hour Emergency Number (CHEMTREC)
USA: 800-424-9300
International: 703-527-3887

All non-emergency numbers should be directed to Customer Service at 800-PURITY1

DICHLOROMETHANE

SDS No. M0061

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Dichloromethane
Synonyms: Methylene Chloride, Methylene Dichloride, Methylene Bichloride, Methane Dichloride, DCM
Recommended Use: This product is recommended for laboratory and manufacturing use only. It is not recommended for drug, food or household use.

2. HAZARDS IDENTIFICATION

Classification:
Acute Toxicity, Oral: GHS Category 4
Skin Irritation: GHS Category 2
Eye Irritation: GHS Category 2B
Carcinogenicity: GHS Category 2

Label Elements
Signal Word: DANGER!
Hazard Statements:
- H302 – Harmful if swallowed.
- H312 – Harmful in contact with skin.
- H320 – Causes eye irritation.
- H332 – Harmful if inhaled.
- H336 – May cause drowsiness or dizziness.
- H350 – May cause cancer.

Precautionary Statements:
- P243 – Take precautionary measures against static discharge.
- P280 – Wear protective gloves/protective clothing/eye protection/face protection.
- P301+P312 – IF SWALLOWED: Calla POISON CENTER or a doctor/physician.
- P303+P361+P353 – If on skin or hair: Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304+P340 – IF INHALED: Call a POISON CENTER or doctor/physician if you feel unwell.

Emergency Overview
Harmful if swallowed, inhaled, or absorbed through the skin. Affects the central nervous system, liver, cardiovascular system, and blood. Causes irritation to the skin, eyes, and respiratory tract. Suspected cancer hazard. Possible static electrical hazard. Target Organs: Blood and central nervous system.

HMIS Rating:
Health – 2* Flammability – 1 Physical Hazard – 0 PPE – User supplied
NOTE: HMIS ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. These ratings are based on the inherent properties of this chemical under expected conditions of normal use and are not intended to be used in emergency situations. PPE is determined by the user based on their needs and conditions.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Ingredient	CAS No	Percent	Hazardous
Dichloromethane	75-09-2	>99%	Yes

4. FIRST-AID MEASURES

Inhalation: If inhaled, remove to fresh air. If breathing is labored or with coughing, give 100% supplemental oxygen. If not breathing, begin artificial respiration. Get medical aid.
Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention.
Eye Contact: Check for and remove contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.
Notes to Physician: Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Flammability: Not expected to be a fire hazard.
Auto-ignition Temperature: 556.1° C (1033° F)
Flash Point: Not applicable.
Flammable Limits: Lower Limit – 15.1 @ 103xC, Upper Limit – 17.3 @ 148xC
Products of Combustion: May decompose into highly toxic and irritating gases (hydrogen chloride, phosgene, carbon monoxide and carbon dioxide) under fire conditions.
Specific Fire Hazards: As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. Vapors mixed with air in proper proportion will propagate a flame.
Specific Explosion Hazards: None
Fire Fighting Media: Use water, dry chemical, chemical foam, or alcohol resistant foam. Use water spray to keep fire exposed containers cool.
National Fire Protective Association: Health - 2, Flammability - 1, Reactivity - 0
NOTE: NFPA ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. They are for use by emergency personnel to address the hazards that are presented by short term, acute exposure to this product under fire, spill, or similar emergencies. Ratings involve data and interpretations that may vary from company to company.

6. ACCIDENTAL RELEASE MEASURES

Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Provide ventilation to the affected area. Avoid run-off into storm sewers and ditches that lead to waterways. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Always use proper personal protective equipment as described in section 8.

7. HANDLING AND STORAGE

Precautions: Always use proper personal protective equipment as described in section 8. Wash thoroughly after handling. Avoid contact with eyes, skin, and clothing. Remove contaminated clothing and wash before reuse. Keep container tightly closed. Avoid ingestion and inhalation.
Storage: Keep away from oxidizing materials. Keep in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Protect from moisture.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Facilities storing or using the material should be equipped with eyewash station and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
Personal Protection: Wear protective chemical goggles or appropriate eye protection. Use appropriate protective gloves and protective clothing to prevent skin exposure. A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever possible. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Exposure Limits:
ACGIH – 50 ppm; 174 mg/m^3
NIOSH – Potential Occupational Carcinogen – see Appendix A Potential NIOSH carcinogen
OSHA Final PELs – 25 ppm (8 hr TWA); 125 ppm STEL (15 min TWA); 1800 mg/m^3 TWA
OSHA Vacated PELs: Methylene chloride: 500 ppm TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance: Clear, colorless liquid.
Odor: Ethereal odor
Odor Threshold: 207-305 ppm
Molecular Formula: CH_2Cl_2
Molecular Weight: 84.93
Auto-ignition Temperature: 556.1° C (1033° F)
Flash Point: Not applicable.
Flammable Limits: Lower Limit – 15.1 @ 103xC, Upper Limit – 17.3 @ 148xC
pH: Not available.
Boiling Point: 104° F
Freezing/Melting Point: -142° F
Decomposition Temperature: Not available
Specific Gravity: 1.33 (Water=1)
Vapor Density (Air=1): 2.9
Vapor Pressure: 350 mm Hg @ 20° C.
Viscosity: Not available
Solubility: Moderately soluble in water
Conductivity: Semiconductive; Conductivity = 4300 pS/m; Dielectric Constant = 8.93; Relaxation Time Constant = 1.8×10^{-2} seconds

10. STABILITY AND REACTIVITY

Stability: Stable
Conditions to Avoid: Incompatible materials, strong oxidants.

Incompatibility With Various Substances: Strong oxidizing agents. Can react dangerously with nitrogen tetroxide, liquid oxygen, potassium, sodium, sodium-potassium alloys, lithium, potassium hydroxide with N-methyl-N-nitroso urea, potassium t-butoxide, and finely powdered aluminum, mixtures of these materials, and liquid ammonia or dimethylaminopropylamine.
Hazardous Decomposition Products: Hydrogen chloride, phosgene, carbon monoxide, carbon, dioxide.
Hazardous Polymerization: Has not been reported.

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, skin absorption, skin contact
Acute Exposure Hazards:

INHALATION HAZARD: Causes irritation to respiratory tract. Has a strong narcotic effect with symptoms of mental confusion, light-headedness, fatigue, nausea, vomiting and headache. Causes formation of carbon monoxide in blood, which affects cardiovascular system and central nervous system. Continued exposure may cause increased light-headedness, staggering, unconsciousness, and even death. Exposure may make the symptoms of angina (chest pains) worse.

INGESTION HAZARD: May cause irritation of the gastrointestinal tract with vomiting. If vomiting results in aspiration, chemical pneumonia could follow. Absorption through gastrointestinal tract may produce symptoms of central nervous system depression ranging from light headedness to unconsciousness.

SKIN CONTACT HAZARD: Causes irritation, redness and pain. Prolonged contact can cause burns. Liquid degreases the skin. May be absorbed through skin.

EYE CONTACT HAZARD: Vapors can cause eye irritation. Contact can produce pain, inflammation and temporal eye damage.

Chronic Exposure Hazards: Possible cancer hazard based on tests with laboratory animals. Prolonged or repeated contact with skin may cause dermatitis. May have fetal effects

Animal Toxicity:
Inhalation, mouse: LC50 = 14,400 ppm/7H;
Inhalation, rat: LC50 = 88 g/m³/30M;
Oral, rat: LD50 = 1600 mg/kg;

Carcinogenicity:
ACGIH: A3- animal carcinogen
California: carcinogen, initial date 4/1/88
NIOSH: occupational carcinogen
NTP: suspect carcinogen
OSHA: possible select carcinogen
IARC: Group 2B carcinogen

Epidemiology: A historical cohort study of persons occupationally exposed to dichloromethane no significantly increased cancer or ischemic heart disease mortality compared to a group of non-exposed employees, as well as general population controls. The most recent update and expansion of this study demonstrated no unusual mortality patterns for hypothesized cause of latency. See IARC Volume 41 for a more detailed discussion.

Teratogenicity:
Specific developmental abnormalities (musculoskeletal/urogenital) observed: Inl-mus TCLo – 1250 ppm/tH, Oral-rat, TDLo = 1260 mg/kg (6-15D preg)
Developmental abnormalities: Craniofacial, Ihl-mouse, TCLo=100 ppm/7Hr (female, 6-15D post); Musculoskeletal, Oral-rat, TDLo+1260 mg/kg (6-15D preg)

Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity: This chemical has a moderate potential to affect some aquatic organisms. It is resistant to biodegradation and has a flow potential to persist in the aquatic environment. 96-hr, EC50 (loss of equilibrium); Fathead minnow: 99 mg/L; 96-

hr, EC10: 66.3 mg/L; Bluegill sunfish: 96-hr, LC50=220 mg/L; Water flea: 24-hr, LC50=2270 mg/L; No observed effect level: 1550 mg/L.
Environmental Fate: This material is not likely to bioconcentrate.

13. DISPOSAL CONSIDERATIONS

Material that cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, use or contamination of this product may change the waste management options. Waste generators must decide if discarded material is a hazardous waste. State and local disposal regulations may differ from federal disposal definitions found in 40 CFR 261.3. Dispose of container and unused contents in accordance with federal, state and local requirements. This material is a "U" listed waste under 40 CFR 261.33 (U080).

14. TRANSPORT INFORMATION

US DOT, IATA, IMO
Proper Shipping Name: Dichloromethane
Hazard Class: 6.1
UN Number: UN1593
Packing Group: III

Canada TDG
Additional Information: Not available

15. REGULATORY INFORMATION

US Federal Regulations:
TSCA: CAS# 75-09-2 is listed on the TSCA Inventory.
Health and Safety Reporting List: CAS# 75-09-2 effective date: 10/4/1982; Sunset date: 10/4/1992
Chemical Test Rules: CAS# 75-09-2 is not listed.
Section 12b: CAS# 75-09-2 is not listed.
TSCA Significant New Use Rule: Does not have an SNUR under TSCA.
CERCLA Hazardous Substances: CAS# 75-09-2 – 1000 lb final RQ; 454 kg final RQ
SARA Section 302: Does not have a TPQ
SARA Codes: CAS# 75-09-2 – acute, chronic
Section 313: Dichloromethane (CAS# 75-09-2) is subject to SARA Title III Section 313 and 40 CFR 373 reporting requirements.
Clean Air Act: CAS# 75-09-2 is listed as a hazardous air pollutant (HAP). It is not a Class 1 Ozone Depleter. It is not a Class 2 Ozone Depleter.
Clean Water Act: CAS# 75-09-2 is listed as a Hazardous Substance. It is listed as a Priority Pollutant. It is not a Toxic Pollutant.
OSHA: Not considered highly hazardous by OSHA.
US State Regulations:
CAS# 75-09-2 is on the following state right-to-know lists: California, Florida, New Jersey, Pennsylvania, Minnesota, and Massachusetts
The following statement is made in order to comply with the California State Drinking Water Act: WARNING: This product contains Methylene chloride, a chemical known to the state of California to cause cancer. California No Significant Risk Level = 50 ug/day.
Canada:
DSL/NDSL: CAS# 75-09-2 is listed on Canada's DSL list.
WHMIS: This product has a WHMIS classification of D1B, D2A, D2B. This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and this MSDS contains all the information required by those regulations.
Ingredient Disclosure List: CAS# 75-09-2 is not listed on Canada's Ingredient Disclosure List.

DSCL (EEC):

Hazard Symbols: Xn

Risk Phrases: R40 – Possible risk of irreversible effects.

Safety Phrases: S23 – Do not inhale gas/fumes/vapor/spray; S24/25 – Avoid contact with skin and eyes; S36/37: Wear suitable protective clothing and gloves.

WGK (Water Danger/protection): CAS# 75-09-2: 2

16. OTHER INFORMATION

Originally Prepared: 3/23/2006
Last Revised: 12/5//2011 – Converted to GHS Format.

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

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Toluene

VALERO

SAFETY DATA SHEET

1. Identification

Product identifier Toluene

Other means of identification

SDS number 411-GHS

Synonyms toluol; phenyl methane; methyl benzene; benzene, methyl-
See section 16 for complete information.

Recommended use This product is intended for use as a refinery feedstock, fuel or for use in engineered processes. Use in other applications may result in higher exposures and require additional controls, such as local exhaust ventilation and personal protective equipment.

Recommended restrictions None known.

Manufacturer / Importer / Supplier / Distributor information

Manufacturer/Supplier Valero Marketing & Supply Company and Affiliates
One Valero Way
San Antonio, TX 78269-6000

General Assistance 210-345-4593

E-Mail CorpHSE@valero.com

Contact Person Industrial Hygienist

Emergency Telephone 24 Hour Emergency 866-565-5220
1-800-424-9300 (CHEMTREC USA)

2. Hazard(s) identification

Physical hazards	Flammable liquids	Category 2
Health hazards	Acute toxicity, oral	Category 4
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2B
	Reproductive toxicity	Category 2
	Specific target organ toxicity, single exposure	Category 1 (central nervous system)
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
	Specific target organ toxicity, single exposure	Category 3 narcotic effects
	Specific target organ toxicity, repeated exposure	Category 2
	Aspiration hazard	Category 1
OSHA defined hazards	Not classified.	

Label elements

Signal word Danger

Hazard statement Highly flammable liquid and vapor. Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Harmful if swallowed. May be fatal if swallowed and enters airways. Causes skin irritation. Causes eye irritation. May cause drowsiness or dizziness. May cause damage to organs (Central nervous system) through prolonged or repeated exposure. Suspected of damaging fertility or the unborn child.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharges. Do not breathe gas/fumes/vapor/spray. Wear protective gloves/protective clothing/eye protection/face protection. Use only outdoors or in a well-ventilated area. When using, do not eat, drink or smoke. Wash thoroughly after handling.

Response
In case of fire: Use foam, carbon dioxide, dry powder or water fog for extinction. If swallowed: Immediately call a poison center/doctor. Do NOT induce vomiting. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash before reuse. Get medical advice/attention if you feel unwell. If exposed or concerned: Call a poison center/doctor.

Storage
Store container tightly closed in well-ventilated place. Keep cool. Store locked up.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)
Static accumulating flammable liquids

Environmental hazards
Hazardous to the aquatic environment, acute hazard — Category 2

Supplemental information

Hazard statement
Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Toxic to aquatic life.

Precautionary statement

Prevention
Avoid release to the environment.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Toluene	108-88-3	>99

4. First-aid measures

Inhalation
Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Skin contact
Remove contaminated clothing and shoes. Wash off immediately with soap and plenty of water. Get medical attention if irritation develops or persists. Wash clothing separately before reuse. Destroy or thoroughly clean contaminated shoes. If high pressure injection under the skin occurs, always seek medical attention.

Eye contact
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention.

Ingestion
Rinse mouth thoroughly. Do not induce vomiting without advice from poison control center. Do not give mouth-to-mouth resuscitation. If vomiting occurs, keep head low so that stomach content does not get into the lungs. Never give anything by mouth to a victim who is unconscious or is having convulsions. Get medical attention immediately.

Most important symptoms/effects, acute and delayed
Irritation. Drowsiness and dizziness. Prolonged exposure may cause chronic effects.

Indication of immediate medical attention and special treatment needed
In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information
If exposed or concerned: get medical attention/advice. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use.

5. Fire-fighting measures

Suitable extinguishing media
Water spray. Water fog. Foam. Dry chemical powder. Carbon dioxide (CO_2).

Unsuitable extinguishing media
Do not use a solid water stream as it may scatter and spread fire.

Specific hazards arising from the chemical
Vapor may cause flash fire. Vapors can flow along surfaces to distant ignition source and flash back. Sensitive to static discharge.

Special protective equipment and precautions for firefighters
Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

Fire-fighting equipment/instructions	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Withdraw immediately in case of rising sound from venting safety devices or any discoloration of tanks due to fire. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Move containers from fire area if you can do it without risk. In the event of fire, cool tanks with water spray. Cool containers exposed to flames with water until well after the fire is out. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Vapors may form explosive air mixtures even at room temperature. Prevent buildup of vapors or gases to explosive concentrations. Some of these materials, if spilled, may evaporate leaving a flammable residue. Water runoff can cause environmental damage. Use compatible foam to minimize vapor generation as needed.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Keep unnecessary personnel away. Local authorities should be advised if significant spills cannot be contained. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. See Section 8 of the MSDS for Personal Protective Equipment.

Methods and materials for containment and cleaning up

ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Extinguish all flames in the vicinity. Keep combustibles (wood, paper, oil, etc.) away from spilled material.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.

Small Spills: Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Cover with plastic sheet to prevent spreading. Collect spillage. Following product recovery, flush area with water. Prevent product from entering drains. Do not allow material to contaminate ground water system. Clean surface thoroughly to remove residual contamination. Wipe up with absorbent material (e.g. cloth, fleece).

Never return spills in original containers for re-use. Prevent entry into waterways, sewers, basements or confined areas. Stop leak if you can do so without risk. This material is a water pollutant and should be prevented from contaminating soil or from entering sewage and drainage systems and bodies of water. Dike the spilled material, where this is possible. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. Should not be released into the environment. Do not allow material to contaminate ground water system. Prevent product from entering drains.

Environmental precautions

If facility or operation has an "oil or hazardous substance contingency plan", activate its procedures. Stay upwind and away from spill. Wear appropriate protective equipment including respiratory protection as conditions warrant. Do not enter or stay in area unless monitoring indicates that it is safe to do so. Isolate hazard area and restrict entry to emergency crew. Flammable. Review Firefighting Measures, Section 5, before proceeding with clean up. Keep all sources of ignition (flames , smoking, flares, etc.) and hot surfaces away from release. Contain spill in smallest possible area. Recover as much product as possible (e.g. by vacuuming). Stop leak if it can be done without risk. Use water spray to disperse vapors. Spilled material may be absorbed by an appropriate absorbent, and then handled in accordance with environmental regulations. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment or drainage systems and natural waterways. Contact fire authorities and appropriate federal, state and local agencies. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, contact the National Response Center at 1-800-424-8802. For highway or railways spills, contact Chemtrec at 1-800-424-9300.

7. Handling and storage

Precautions for safe handling

Eliminate sources of ignition. Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity.
Wear personal protective equipment. Do not breathe gas/fumes/vapor/spray. Avoid contact with eyes, skin, and clothing. Do not taste or swallow. Avoid prolonged exposure. Use only with adequate ventilation. Wash thoroughly after handling. The product is extremely flammable, and explosive vapor/air mixtures may be formed even at normal room temperatures. DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. When using, do not eat, drink or smoke. Avoid release to the environment.

Conditions for safe storage, including any incompatibilities

Flammable liquid storage. Do not handle or store near an open flame, heat or other sources of ignition. This material can accumulate static charge which may cause spark and become an ignition source. The pressure in sealed containers can increase under the influence of heat. Keep container tightly closed in a cool, well-ventilated place. Keep away from food, drink and animal feedingstuffs. Keep out of the reach of children.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-2 (29 CFR 1910.1000)

Components	Type	Value
Toluene (CAS 108-88-3)	Ceiling	300 ppm
	TWA	200 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
Toluene (CAS 108-88-3)	TWA	20 ppm

US NIOSH Pocket Guide to Chemical Hazards: Recommended exposure limit (REL)

Components	Type	Value
Toluene (CAS 108-88-3)	TWA	375 mg/m3
		100 ppm

US NIOSH Pocket Guide to Chemical Hazards: Short Term Exposure Limit (STEL)

Components	Type	Value
Toluene (CAS 108-88-3)	STEL	560 mg/m3
		150 ppm

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
Toluene (CAS 108-88-3)	0.3 mg/g	o-Cresol, with hydrolysis	Creatinine in urine	*
	0.03 mg/l	Toluene	Urine	*
	0.02 mg/l	Toluene	Blood	*

* - For sampling details, please see the source document.

Exposure guidelines

US - California OELs: Skin designation

Toluene (CAS 108-88-3) — Can be absorbed through the skin.

US - Minnesota Haz Subs: Skin designation applies

Toluene (CAS 108-88-3) — Skin designation applies.

Appropriate engineering controls — Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Use explosion-proof equipment.

Individual protection measures, such as personal protective equipment

Eye/face protection — Wear safety glasses. If splash potential exists, wear full face shield or chemical goggles.

Skin protection

Hand protection — Avoid exposure - obtain special instructions before use. Wear protective gloves. Protective gloves.

Other — Wear chemical-resistant, impervious gloves. Full body suit and boots are recommended when handling large volumes or in emergency situations. Flame retardant protective clothing is recommended.

Respiratory protection — Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If workplace exposure limits for product or components are exceeded, NIOSH approved equipment should be worn. Proper respirator selection should be determined by adequately trained personnel, based on the contaminants, the degree of potential exposure and published respiratory protection factors. This equipment should be available for nonroutine and emergency use.

Thermal hazards — Not available.

General hygiene considerations — Consult supervisor for special handling instructions. Avoid contact with eyes. Avoid contact with skin. Keep away from food and drink. Wash hands before breaks and immediately after handling the product. Provide eyewash station and safety shower. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Appearance — Colorless liquid.

Physical state — Liquid.

Form	Liquid.
Color	Colorless.
Odor	Sweet. Pungent.
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	42 °F (5.56 °C)
Initial boiling point and boiling range	230.8 °F (110.44 °C)
Flash point	40.7 °F (4.8 °C) Closed Cup
Evaporation rate	2 (n-Butyl Acetate = 1)
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	1.2 %
Flammability limit - upper (%)	7.1 %
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	3.14
Relative density	Not available.
Solubility(ies)	Very slightly soluble.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	996.5 °F (535.83 °C)
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Molecular formula	C7-H8
Molecular weight	92.14 g/mol
Percent volatile	100 %

10. Stability and reactivity

Reactivity	Stable at normal conditions.
Chemical stability	Stable under normal temperature conditions and recommended use.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Heat, flames and sparks. Ignition sources. Contact with incompatible materials. Do not pressurize, cut, weld, braze, solder, drill, grind or expose empty containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death.
Incompatible materials	Strong oxidizing agents. Reducing agents. Acids. Alkalis.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure	
Ingestion	Harmful if swallowed. May be fatal if swallowed and enters airways.
Inhalation	May cause drowsiness or dizziness. May cause damage to organs (Central nervous system) through prolonged or repeated exposure.
Skin contact	Causes skin irritation.
Eye contact	Causes eye irritation.
Symptoms related to the physical, chemical and toxicological characteristics	Irritation. Drowsiness and dizziness. May cause damage to organs (Central nervous system) through prolonged or repeated exposure.

Information on toxicological effects

Acute toxicity Harmful if swallowed - may enter lungs if swallowed or vomited.

Components	Species	Test Results
Toluene (CAS 108-88-3)		
Acute		
Dermal		
LD50	Rabbit	14.1 ml/kg
Inhalation		
LC50	Rat	49000 mg/m³, 4 Hours
Oral		
LD50	Rat	636 mg/kg

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/eye irritation Causes eye irritation.

Respiratory sensitization Not assigned.

Skin sensitization Not assigned.

Germ cell mutagenicity Not assigned.

Carcinogenicity This material is not classified as a carcinogen by IARC, ACGIH, NTP or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity

Toluene (CAS 108-88-3) 3 Not classifiable as to carcinogenicity to humans.

Reproductive toxicity May damage fertility or the unborn child.
Avoid contact during pregnancy/while nursing. Toluene: May adversely affect the developing fetus.

Specific target organ toxicity - single exposure May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure May cause damage to organs (Central nervous system) through prolonged or repeated exposure.

Aspiration hazard May be fatal if swallowed and enters airways.

Chronic effects Toluene has been reported to decrease immunological responses and cause recordable hearing loss in laboratory animals. Contains organic solvents which in case of overexposure may depress the central nervous system causing dizziness and intoxication.

Further information Abusive inhalation of toluene ("glue sniffing") has been reported to be associated with birth defects in the offspring of abusers.

12. Ecological information

Ecotoxicity

Components		Species	Test Results
Toluene (CAS 108-88-3)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	5.46 - 9.83 mg/l, 48 hours
Fish	LC50	Coho salmon,silver salmon (Oncorhynchus kisutch)	5.5 mg/l, 96 hours
		Pink salmon (Oncorhynchus gorbuscha)	6.86 - 8.48 mg/l, 96 hours

Persistence and degradability No data available.

Bioaccumulative potential No data available.

Partition coefficient n-octanol / water (log Kow)

Toluene (CAS 108-88-3) 2.73

Mobility in soil Not available.

Other adverse effects None known.

13. Disposal considerations

Disposal instructions Dispose in accordance with all applicable regulations. This material and its container must be disposed of as hazardous waste. Dispose of this material and its container to hazardous or special waste collection point. Incinerate the material under controlled conditions in an approved incinerator. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container.

Local disposal regulations Dispose of in accordance with local regulations.

Hazardous waste code D001: Waste Flammable material with a flash point <140 °F
U220: Waste Toluene

US RCRA Hazardous Waste U List: Reference

Benzene (CAS 71-43-2)	U019
Toluene (CAS 108-88-3)	U220

Waste from residues / unused products Dispose in accordance with all applicable regulations.

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Offer rinsed packaging material to local recycling facilities.

14. Transport information

DOT

UN number	UN1294
UN proper shipping name	Toluene
Transport hazard class(es)	3
Subsidiary class(es)	-
Packing group	II
Special precautions for user	Not available.
Special provisions	IB2, T4, TP1
Packaging exceptions	150
Packaging non bulk	202
Packaging bulk	242

IATA

UN number	UN1294
UN proper shipping name	Toluene
Transport hazard class(es)	3
Subsidiary class(es)	-
Packaging group	II
Environmental hazards	No
Labels required	Not available.
ERG Code	3L
Special precautions for user	Not available.

IMDG

UN number	UN1294
UN proper shipping name	TOLUENE
Transport hazard class(es)	3
Subsidiary class(es)	-
Packaging group	II
Environmental hazards	
Marine pollutant	No
Labels required	Not available.
EmS	F-E, S-D
Special precautions for user	Not available.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code This product is a liquid and when transported in bulk is covered under MARPOL 73/78 Annex II.
This product is listed in the IBC Code.
Ship type: 3
Pollution category: Y

15. Regulatory information

US federal regulations This product is hazardous according to OSHA 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

BENZENE (CAS 71-43-2)
Cancer
Central nervous system
Blood
Aspiration
Skin
Eye
Respiratory tract irritation
Flammability

CERCLA Hazardous Substance List (40 CFR 302.4)

Toluene (CAS 108-88-3)	LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No
SARA 302 Extremely hazardous substance	No
SARA 311/312 Hazardous chemical	No

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Toluene (CAS 108-88-3)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130)	Hazardous substance Priority pollutant Toxic pollutant
Safe Drinking Water Act (SDWA)	0 mg/l 1 mg/l

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Toluene (CAS 108-88-3) 6594

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Toluene (CAS 108-88-3) 35 % weight/volumn

DEA Exempt Chemical Mixtures Code Number

Toluene (CAS 108-88-3) 594

Food and Drug Administration (FDA)	Not regulated.
US state regulations	WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Benzene (CAS 71-43-2)
Toluene (CAS 108-88-3)

US. New Jersey Worker and Community Right-to-Know Act

Toluene (CAS 108-88-3) 500 lbs

US. Pennsylvania RTK - Hazardous Substances

Toluene (CAS 108-88-3)

US. Rhode Island RTK

Toluene (CAS 108-88-3)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Benzene (CAS 71-43-2)
Toluene (CAS 108-88-3)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

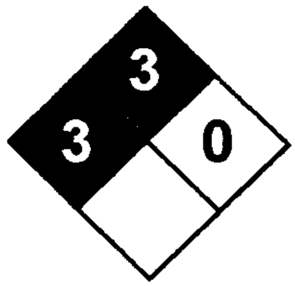
16. Other information, including date of preparation or last revision

Issue date 18-December-2012

Revision date 27-June-2013

Version # 02

NFPA Ratings



Disclaimer

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Attachment 3:

Safety Meeting Record Form

Safety Meeting Record Form

Project No.: ______________________ **Date:** ________________________

Meeting Conducted by: ____

Meeting Topics/Safety Reminders:

- ☐ Drilling pinch points
- ☐ Traffic
- ☐ Terrain
- ☐ Overhead hazards
- ☐ Underground hazards
- ☐ Proper lifting procedures
- ☐ Slips/trips/falls
- ☐ Housekeeping
- ☐ Heat/cold stress
- ☐ Noise
- ☐ Dust
- ☐ Biological (stinging insects, snakes, etc.)
- ☐ Other: ____

____

Meeting Attended By:

______________________________ ______________________________

______________________________ ______________________________

______________________________ ______________________________

______________________________ ______________________________

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______________________________ ______________________________

______________________________ ______________________________

______________________________ ______________________________

Comments and Employee Feedback: ________________________________

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Attachment 4:

Andrews Engineering Sampling Standard Operating Procedures

Andrews Engineering
Standard Operating Procedures

Drum Sampling Protocol

Contents

Original March 2002
Updated May 2009

Drum Sampling Protocol

1.0 Introduction

The purpose of this standard operating procedure (SOP) is to provide technical guidance on implementing safe and cost-effective response actions at hazardous waste sites containing drums with unknown contents. Container contents are sampled and characterized for disposal, bulking, recycling, segregation, and classification purposes. These are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent on site conditions, equipment limitations or limitations imposed by the procedure. In all instances, the ultimate procedures employed should be documented and associated with the final report.

2.0 Method Summary

Prior to sampling, drums must be excavated (if necessary), inspected, staged, and opened. Drum excavation must be performed by qualified personnel. Inspection involves the observation and recording of visual qualities of each drum and any characteristics pertinent to the classification of the drum's contents. Staging involves the physical grouping of drums according to classifications established during the physical inspection. Opening of closed drums may be performed manually or remotely. Remote drum opening is recommended for worker safety. The most widely used method of sampling a drum involves the use of a drum thieves/samplers. This method is quick, simple, relatively inexpensive, and requires no decontamination. The contents of a drum can be further characterized by performing various field tests.

3.0 Personal Protective Equipment

Each member of the sampling team should be minimally equipped with the following:

- Steel-toed boots
- Safety glasses
- Gloves
- Coveralls (or long-sleeved shirt and pants)

4.0 Sample Perservation, Containers,Handling, And Storage

Samples collected from drums are considered waste samples and as such, adding preservatives is not required due to the potential reaction of the sample with the preservative. Samples should, however, be cooled to 4° C and protected from sunlight in order to minimize any potential reaction due to the light sensitivity of the sample.

Sample bottles for collection of waste liquids, sludges, or solids are typically wide mouth amber jars with Teflon-lined screw caps. Actual volume required for analysis should be determined in conjunction with the laboratory performing the analysis.

Waste sample handling procedures should be as follows:

1. Label the sample container with the appropriate sample label and complete the appropriate field data sheet(s). Place sample container into two resealable plastic bags.

2. Place each bagged sample container into a shipping container which has been lined with plastic. Pack the container with enough non-combustible, absorbent, cushioning material to minimize the possibility of containers breaking, and to absorb any material which may leak.

   Note: Depending on the nature and quantity of the material to be shipped, different packaging may be required. The transportation company or a shipping/receiving expert should be consulted prior to packing the samples.

3. Complete a chain of custody record for each shipping container, place into a resealable plastic bag, and affix to the inside lid of the shipping container.

4. Secure and custody seal the lid of the shipping container. Label the shipping container appropriately and arrange for the appropriate transportation mode consistent with the type of hazardous waste involved.

5.0 Interferences and Potential Problems

If buried drums are suspected, geophysical investigation techniques such as magnetometry or ground penetrating radar may be employed in an attempt to determine the location and depth of drums. During excavation, the soil must be removed with great caution to minimize the potential for drum rupture.

Until the contents are characterized, sampling personnel should assume that unlabelled drums contain hazardous materials. Labelled drums are frequently mislabelled, especially drums that are reused. Because a drum's label may not accurately describe its contents, extreme caution must be exercised when working with or around drums.

If a drum which contains a liquid cannot be moved without rupture, its contents may be immediately transferred to a sound drum using an appropriate method of transfer based on the type of waste. In any case, preparations should be made to contain the spill (i.e., spill pads, dike, etc.) should one occur.

If a drum is leaking, open, or deteriorated, then it must be placed immediately in overpack containers.

The practice of tapping drums to determine their contents is neither safe nor effective and should not be used if the drums are visually overpressurized or if shock-sensitive materials are suspected. A laser thermometer may be effective in order to determine the level of the drum contents via surface temperature differences.

Drums that have been overpressurized to the extent that the head is swollen several inches above the level of the chime should not be moved. A number of devices have been developed for venting critically swollen drums. One method that has proven to be effective is a tube and spear device. A light aluminum tube (3 meters long) is positioned at the vapor space of the drum. A rigid, hooking device attached to the tube goes over the chime and holds the tube securely in place. The spear is inserted in the tube and positioned against the drum wall. A sharp los on the end of the spear drives the sharpened tip through the drum and the gas vents along the grooves. Venting should be done from behind a wall or barricade. Once the pressure has been relieved, the bung can be removed and the drum sampled.

Because there is potential for accidents to occur during handling, particularly initial handling, drums should only be handled if necessary. All personnel should be warned of the hazards prior to handling drums. Overpack drums and an adequate volume of absorbent material should be kept near areas where minor spills may occur. Where major spills may occur, a containment berm adequate to contain the entire volume of liquid in the drums should be constructed before any handling takes place. If drum contents spill, personnel trained in spill response should be used to isolate and contain the spill.

6.0 Equipment/Apparatus

The following are standard materials and equipment required for sampling:

- Personal protection equipment
- Wide-mouth amber glass jars with Teflon cap liner, approximately 500 mL volume
- Other appropriate sample jars
- Uniquely numbered sample identification labels with corresponding data sheets
- Drum/Tank Sampling Data Sheets and Field Test Data Sheets for Drum/Tank Sampling
- Chain-of-Custody records
- Decontamination materials
- Thieving tubes, drum samplers, or COLIWASA Coring device
- Stainless steel spatula or spoons
- Laser thermometer
- Drum overpacks
- Absorbent material for spills
- Drum opening devices

7.0 Reagents

Reagents are not typically required for preserving drum samples. However, reagents will be utilized for decontamination of sampling equipment.

8.0 Procedures

8.1 Preparation

- Determine the extent of the sampling effort, the sampling methods to be employed, and the types and amounts of equipment and supplies needed.
- Obtain necessary sampling and monitoring equipment.
- Decontaminate or preclean equipment, and ensure that it is in working order.
- Prepare scheduling and coordinate with staff, clients, and regulatory agency, if appropriate.
- Perform a general site survey prior to site entry in accordance with the site-specific Health and Safety Plan.
- Use stakes, flagging, or buoys to identify and mark all sampling locations. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions.

8.2 Drum Excavation

If it is presumed that buried drums are on site and prior to beginning excavation activities, geophysical investigation techniques should be utilized to approximate the location and depth of the drums. In addition, it is important to ensure that all locations where excavation will occur are clear of utility lines, pipes and poles (subsurface as well as above surface).

Excavating, removing, and handling drums are generally accomplished with conventional heavy construction equipment. These activities should be performed by an equipment operator who has experience in drum excavation. During excavation activities, drums must be approached in a manner that will avoid digging directly into them.

The soil around the drum should be excavated with non-sparking hand tools or other appropriate means and as the drums are exposed, a visual inspection should be made to determine the condition of the drums. Ambient air monitoring should be done to determine the presence of unsafe levels of volatile organics, explosives, or radioactive materials. Based on this preliminary visual inspection, the appropriate mode of drum excavation and handling may be determined.

Drum identification and inventory should begin before excavation. Information such as location, date of removal, drum identification number, overpack status, and any other identification marks should be recorded in the project field book.

8.3 Drum Inspection

Appropriate procedures for handling drums depend on the contents. Thus, prior to any handling, drums should be visually inspected to gain as much information as possible about their contents. The drums should be inspected for the following:

1. Drum condition, corrosion, rust, punctures, bungs, and leaking contents.
2. Symbols, words, or other marking on the drum indicating hazards (i.e., explosive, radioactive, toxic, flammable), or further identifying the drums.
3. Signs that the drum is under pressure.
4. Shock sensitivity.

Monitoring should be conducted around the drums using instruments such as radiation meters, organic vapor analyzers (OVA), photoionization detectors (PID), and combustible gas indicators (CGI).

- Survey results can be used to classify the drums into categories, for instance:
- Radioactive
- Leaking/deteriorating
- Bulging
- Lab packs
- Explosive/shock sensitive
- Empty

All personnel should assume that unmarked drums contain hazardous materials until their contents have been categorized. Once a drum has been visually inspected and any immediate hazard has been eliminated by overpacking or transferring the drum's contents, the drum is affixed with a numbered tag and transferred to a staging area. Color-coded tags, labels or bands should be used to identify the drum's category based on visual inspection. A description of each drum, its condition, any unusual markings, the location where it was buried or stored, and field monitoring information are recorded.

8.4 Drum Staging

Prior to sampling, the drums should be staged to allow easy access. Ideally, the staging area should be located just far enough from the drum opening area to prevent a chain reaction if one drum should explode or catch fire when opened.

During staging, the drums should be physically separated into the following categories: those containing liquids, those containing solids, those containing lab packs, and those which are empty. This is done because the strategy for sampling and handling drums/containers in each of these categories will be different. This may be achieved by visual inspection of the drum and its labels, codes, etc. Solids and sludges are typically disposed of in open top drums. Closed head drums with a bung opening generally contain liquid.

Where there is good reason to suspect that drums contain radioactive, explosive, or shock-sensitive materials, these drums should be staged in a separate, isolated area. Placement of explosives and shock-sensitive materials in diked and fenced areas will minimize the hazard and the adverse effects of any premature detonation of explosives.

Where space allows, the drum opening area should be physically separated from the drum removal and drum staging operations. Drums are moved from the staging area to the drum opening area one at a time using forklift trucks equipped with drum grabbers or a barrel grappler. In a large-scale drum handling operations, drums may be conveyed to the drum opening area using a roller conveyor. Drums may be restaged as necessary after opening and sampling.

8.5 Drum Opening

There are three basic techniques available for opening drums at hazardous waste sites:

- Manual opening with non-sparking bung wrenches
- Drum deheading
- Remote drum puncturing or bung removal

The choice of drum opening techniques and accessories depends on the number of drums to be opened, their waste contents, and physical condition. Remote drum opening equipment should always be considered in order to protect worker safety. Under OSHA 1910.120, manual drum opening with bung wrenches or deheaders should be performed ONLY with structurally sound drums and waste contents that are known to be non-shock sensitive, non-reactive, non-explosive, and non-flammable.

8.5.1 <u>Manual Drum Opening with a Bung Wrench</u>

Manual drum opening with bung wrenches should not be performed unless the drums are structurally sound (no evidence of bulging or deformation) and their contents are known to be non-shock sensitive, non-reactive, non-explosive or non-flammable. If openingthe drum with bung wrenches is deemed safe, then certain procedures should be implemented to minimize the hazard:

- Field personnel should be fully outfitted with protective gear.
- Drums should be positioned upright with the bung up, or, for drums with bungs on the side, laid on their sides with the bung plugs up.
- The wrenching motion should be a slow, steady pull across the drum. If the length of the bung wrench handle provides inadequate leverage for unscrewing the plug, a "cheater bar" can be attached to the handle to improve leverage.

8.5.2 Manual Drum Opening with a Drum Deheader

Drums are opened with a drum deheader by first positioning the cutting edge just inside the top chime and then tightening the adjustment screw so that the deheader is held against the side of the drum. Moving the handle of the deheader up and down while sliding the deheader along the chime will enable the entire top to be rapidly cut off if so desired. If the top chime of a drum has been damaged or badly dented it may not be possible to cut the entire top off. Since there is always the possibility that a drum may be under pressure, the initial cut should be made very slowly to allow for the gradual release of any built-up pressure. A safer technique would be to employ a remote method prior to using the deheader.

Self-propelled drum openers which are either electrically or pneumatically driven are available and can be used for quicker and more efficient deheading.

The drum deheader should be decontaminated, as necessary, after each drum is opened to avoid cross contamination and/or adverse chemical reactions from incompatible materials.

8.5.3 Manual Drum Opening with a Hand Pick, Pickaxe, or Spike

When a drum must be opened and neither a bung wrench nor a drum deheader is suitable, then it can be opened for sampling by using a hand pick, pickaxe, or spike. Often the drum lid or head must be hit with a great deal of force in order to penetrate it. Because of this, the potential for splash or spraying is greater than with other opening methods and therefore, this method of drum opening is not recommended, particularly when opening drums containing liquids. Some spikes used have been modified by the addition of a circular splash plate near the penetrating end. This plate acts as a shield and reduces the amount of splash in the direction of the person using the spike. Even with this shield, good splash gear is essential.

Since drums, some of which may be under pressure, cannot be opened slowly with these tools, spray from drums is common and appropriate safety measures must be taken. The pick or spike should be decontaminated after each drum is opened to avoid cross contamination and/or adverse chemical reaction from incompatible materials.

8.5.4 Remote Drum Opening with a Backhoe Spike

Remotely operated drum opening tools are the safest available means of drum opening. Remote drum opening is slow, but provides a high degree of safety compared to manual methods of opening. In the opening area, drums should be placed in rows with adequate aisle space to allow ease in backhoe maneuvering. Once staged, the drums can be quickly opened by punching a hole in the drum head or lid with the spike.

The spike should be decontaminated after each drum is opened to prevent cross contamination and/or adverse reaction from incompatible material. Even though some splash or spray may occur when this method is used, the operator of the backhoe can be protected by mounting a large shatter-resistant shield in front of the operator's cage. This combined with the normal personal protection gear should be sufficient to protect the operator. Additional respiratory protection can be afforded by providing the operator with an on-board airline system.

8.5.5 Remote Drum Opening with Hydraulic Devices

A piercing device with a non-sparking, metal point is attached to the end of a hydraulic line and is pushed into the drum by the hydraulic pressure. The piercing device can be attached so that a hole for sampling can be made in either the side or the head of the drum. Some of the metal piercers are hollow or tube-like so that they can be left in place if desired and serve as a permanent tap or sampling port. The piercer is designed to establish a tight seal after penetrating the container.

8.5.6 Remote Drum Opening with Pneumatic Devices

Pneumatically-operated devices utilizing compressed air have been designed to remove drum bungs remotely. Prior to opening the drum, a bung fitting must be selected to fit the bung to be removed. The adjustable bracketing system is then attached to the drum and the pneumatic drill is aligned over the bung. This must be done before the drill can be operated. The operator then moves away from the drum to operate the equipment. Once the bung has been loosened, the bracketing system must be removed before the drum can be sampled. This remote bung opener does not permit the slow venting of the container, and therefore appropriate precautions must be taken. It also requires the container to be upright and relatively level. Bungs that are rusted shut cannot be removed with this device.

8.6 Drum Sampling

After the drum has been opened, preliminary monitoring of headspace gases should be performed first with an explosimeter/oxygen meter. Afterwards, an OVA or other instruments should be used. If possible, these instruments should be intrinsically safe. In most cases it is impossible to observe the contents of these sealed or partially sealed drums. Since some layering or stratification is likely in any solution left undisturbed, a sample that represents the entire depth of the drum must be taken.

When sampling a previously sealed drum, a check should be made for the presence of a bottom sludge. This is easily accomplished by measuring the depth to apparent bottom then comparing it to the known interior depth.

8.6.1 Drum Thief/Sampler

The most widely used implement for sampling drum liquids is a tube commonly referred to as a drum thief/sampler. This tool is cost effective, quick, and disposable. Procedures for use are:

1. Remove the cover from the sample container.
2. Insert tubing almost to the bottom of the drum or until a solid layer is encountered. About one foot of tubing should extend above the drum
3. Allow the waste in the drum to reach its natural level in the tube.

4. Cap the top of the sampling with a tapered stopper or thumb, ensuring liquid does not come into contact with the stopper.
5. Carefully remove the capped tube from the drum and insert the uncapped end into the appropriate sample container.
6. Release stopper and allow the sampler to drain until the container is approximately two-thirds full.
7. Remove the tube from the sample container and dispose of properly.
8. Cap the sample container tightly and label it. Place the sample container into a carrier.
9. Replace the bung or place plastic over the drum.
10. Log all samples in the site fieldbook.
11. Transport the sample to the decontamination zone and package it for transport to the analytical laboratory, as necessary. Complete chain-of-custody records.

9.0 Quality Assurance/Quality Control

The following general quality assurance procedures apply:

All data must be documented on the Chain-of-Custody records and in the project fieldbook.
All instrumentation must be in accordance with operating instructions as supplied by the manufacturer, unless specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation, and they must be documented.

Andrews Engineering
Standard Operating Procedures

Sample Packaging

Contents

REVISION LOG		
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Sample Packaging

1.0 INTRODUCTION

Liquid and solid environmental samples are routinely collected by field staff during field surveys, site investigations, and other site visits for laboratory analysis. Unless the samples have anesthetic, noxious, or other properties that could inhibit the ability of a flight crew member to perform his or her duty or are known to meet the established United States Department of Transportation (USDOT) criteria for hazardous material (e.g., explosive, corrosive, flammable, poisonous), they are not regulated as hazardous materials.

This procedure describes the packaging procedures to be used by Andrews Engineering staff to ensure the safe arrival of the samples at the laboratory for analyses. These procedures have been developed to reduce the risk of damage to the samples (e.g., breakage of the sample containers), promote the maintenance of sample temperature within the cooler, and prevent spillage of the sampled material should a container be broken.

In the event the sample material meets the established criteria of a USDOT hazardous material, the reader is referred to the USDOT shipping manual and regulations maintained in the Andrews Engineering Springfield Office. This document provides information needed for shipping samples by providing guidance on:

- Hazardous determination for samples which meet the USDOT definition of a hazardous material;
- Shipping profiles for "standard" shipments;
- Shipping procedures for "non-standard" shipments;
- Marking of packages containing hazardous materials;
- Labeling of packages containing hazardous materials; and
- Preparation of shipping papers for hazardous materials shipment.

2.0 SCOPE

This procedure describes procedures for the packaging of non-hazardous environmental samples in:

- Coolers;
- Steel, aluminum, and plastic drums; and
- Fiberboard boxes.

3.0 SAMPLE PACKAGING PROCEDURES

3.1 General

It is Andrews Engineering's intent to package samples so there is no chance of leakage during shipment. This is to prevent the loss of samples and the expenditure of funds for emergency responses to spills and the efforts necessary to re-obtain the sample.

Andrews Engineering has developed several "standard" package configurations for the shipping of environmental samples. These standard package configurations are described below.

Liquid samples are particularly vulnerable. Because shipping companies do not know the difference between a package leaking distilled water and a package leaking a hazardous chemical, they will react to a spill in an emergency fashion, potentially causing enormous expense to Andrews Engineering for the cleanup of the sample material. Therefore, liquids should be packed in multiple layers of plastic bags and absorbent/cushioning material to preclude possibility of leaks from a package. This section defines the standard packaging configurations for liquid environmental samples.

3.2 Liquid Environmental Sample Packaging Procedures

Liquid environmental samples should be collected and preserved as outlined in the procedure for sample collection and containers. Liquid samples may be shipped using a cooler or an outer package consisting of either a steel or aluminum drum. Because the steel and aluminum drums provide little insulating capability, they should not be used for samples that require icing. Further care should be exercised shipping samples during the winter months to prevent drainage from freezing.

3.2.1 Packaging Liquid Environmental Samples Using a Cooler

- Label and seal all water sample bottles according to appropriate sampling procedures;
- Secure the bottle caps as necessary using fiberglass tape; and
- Place each amber, poly, and volatile organic analysis (VOA) bottle in a sealable plastic bag.

If a foam block insert is used:

- Line the cooler with two plastic bags;
- Place a foam insert (with holes cut to receive the sample bottles) inside the plastic bag;
- Place the bottles in the holes in the foam block;
- Fill void spaces with bagged ice to the top of the cooler;

- Fold over the plastic bags lining the cooler and close with tape;
- Place Chain-of-Custody (C-O-C) form in a sealable bag and tape it to the inside of the cooler lid; and
- Secure the cooler with strapping tape and custody seal. Cover the custody seals with clear tape.

If vermiculite or shipping peanuts are used:

- Place one inch of inert absorbent material in the bottom of the cooler;
- Line the cooler with two plastic bags;
- Place each sample bottle inside the inner bag;
- Fill the void spaces around the bottles with vermiculite or peanuts to about half the height of the large bottles;
- Fill the remainder of the void spaces with bagged ice to within four inches of the top of the cooler, making sure the VOAs are in direct contact with a bag of ice;
- Fold over the plastic bags lining the cooler and close with tape;
- Fill the remaining space in the cooler with vermiculite or shipping peanuts to the top of the cooler;
- Place C-O-C form in a sealable bag and tape it to the inside of the cooler lid; and
- Secure the cooler with strapping tape and custody seal. Cover the custody seals with clear tape.

3.2.2 Alternate Packaging Using Drum

- Place three inches of inert absorbent material (vermiculite) in the bottom of the drum;
- Line the drum with two plastic bags;
- Place each sample bottle inside the inner bag;
- Fill the void spaces around the bottles with vermiculite to the height of the larger bottles;
- Fold over the plastic bags lining the drum and close with tape;
- Fill the remaining space in the drum with vermiculite to the top of the drum;

- Place C-O-C form in a sealable bag and tape it to the inside of the drum lid; and
- Secure the drum with closing ring and apply custody seals. Cover the custody seals with clear tape.

NOTE: Often times the sampling media provided by the laboratory is sufficiently protected by foam block inserts, vermiculite, shipping peanuts, or bubble wrap. In these instances, ensure the media is adequately protected using the laboratory supplied materials and proceed with the outlined steps for cooling, sealing, and preparing the packages for shipment or delivery.

3.3 Soil/Sediment Environmental Sample Packaging Procedures

Soil/sediment environmental samples should be collected as outlined in the proper ASTM Standard. Soil/sediment environmental samples may be shipped using a cooler, a fiberboard combination package, or an outer package consisting of either a steel or aluminum drum. Because the steel and aluminum drums provide little insulating capability, they should not be used for samples that require icing.

3.3.1 <u>Packaging Soil/Sediment Environmental Samples</u>

- Label and seal each sample container according to sampling procedures;
- Secure the bottle caps using fiberglass tape, as necessary;
- Place each sample bottle inside a sealable plastic bag and place it in its original shipping box or in individual fiberboard boxes; and
- Secure the original shipping box with strapping tape, place shipping box in a plastic bag, and secure the plastic bag with tape.

If a cooler is used:

- Place bubble pack or similar material on the bottom and sides of the cooler;
- Place the bagged shipping boxes in the cooler with a layer of bubble pack between each box;
- Fill the void spaces with "blue ice" or ice in baggies to the top of the cooler;
- Place C-O-C form in a sealable baggie and tape it to the inside of the cooler lid; and
- Secure the cooler with strapping tape and custody seal. Cover the seals with clear tape.

If a drum is used:

- Place three inches of inert absorbent material (vermiculite) or shipping peanuts in the bottom of the drum;

- Line the drum with two plastic garbage bags;
- Place the boxes inside the inner bag;
- Fill the space around the samples with vermiculite or shipping peanuts;
- Fold over the plastic bags lining the drum and secure shut with tape;
- Fill the remaining space around the bags with vermiculite or shipping peanuts to the top of the drum;
- Place C-O-C form in a sealable bag and tape it to the inside of the drum lid; and
- Secure the drum with the closing ring and apply custody seals. Cover the custody seals with clear tape.

NOTE: If a small number of samples are being shipped, it may be more practical to package them using the vermiculite or foam block configurations used for shipping liquid samples. Often times the sampling media provided by the laboratory is sufficiently protected by foam block inserts, vermiculite, shipping peanuts, or bubble wrap. In these instances, ensure the media is adequately protected using the laboratory supplied materials and proceed with the outlined steps for cooling, sealing, and preparing the packages for shipment or delivery.

4.0 SHIPPING PROCEDURES

Environmental samples are to be shipped as nonhazardous cargo. Unless the samples have anesthetic, noxious, or other properties that could inhibit the ability of a flight crew member to perform his or her duty or are known to meet the established U.S. Department of Transportation criteria for a hazardous material (e.g., explosive, corrosive, flammable, poisonous), they are not regulated as hazardous materials. When preparing the containers (e.g., cooler, drum, or box) for shipment, staff **must** remove all labels from the outside container. Labels indicating that the contents may be hazardous are misleading and are not appropriate. Markings indicating ownership of the container, destination, and chain-of-custody labels are acceptable and can be attached as required.

When completing the paperwork for shipment, the standard nonhazardous forms must be used. Do not use the hazardous materials/dangerous goods airbills, either in total or in part; these forms are coded and their use will invite unnecessary questions. This will only serve to confuse Airborne, UPS, or Federal Express' terminal personnel and will cause much frustration and the delay of sample shipment.

Environmental sample packages can be shipped overnight by overnight by Airborne, UPS, or Federal Express. When choosing between the two, cost should be considered. It is normally much cheaper to ship UPS. For work conducted and paid for by Andrews Engineering, it is our policy that you must first attempt to ship by UPS before considering Federal Express. In addition, Airborne tends to have remote locations open later in the evenings than Federal Express, which may be helpful when trying to complete a full day's sampling effort and still make the flights on time. In almost all cases, both companies will deliver to the laboratory of your choice on Saturdays. The laboratory should be contacted in advance so that personnel are working to receive the package, log the package in to the system, and take any additional steps to properly preserve the sample. When planning for sampling activities, check with the companies in advance to verify pick-up and delivery schedules.

5.0 ALTERNATE SHIPPING PROCEDURES

Environmental sample packages may also be delivered directly to the laboratory or transferred to a laboratory employee courier. When delivering directly to a laboratory or transferring to a courier, the chain of custody shall reflect the time and date the samples were transferred from possession of Andrews Engineering personnel to the laboratory personnel or courier. The laboratory should be contacted in advance so that personnel are working to receive the package, log the package in to the system, and take any additional steps to properly preserve the sample.

Andrews Engineering
Standard Operating Procedures

Sample Preservation, Containers, and Holding Times

Contents

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Sample Preservation, Containers, and Holding Times

1.0 INTRODUCTION

The objective of this procedure document is to provide an easily-verifiable document to guide field personnel in the appropriate sample preservation, container material, and applicable holding times for samples collected in the field.

2.0 SCOPE

This document describes the correct methodology for sample preservation, container type, and holding times that must be followed in order to ensure that samples are being handled correctly, after field collection, based upon the type of analyses being performed in the laboratory.

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

The primary goal is to obtain a representative analysis of the host sample medium. The host medium may be a solid or liquid, such as contaminated soil, wastewater, groundwater, stormwater, sludge, or the waste product itself. Field personnel can compromise the analysis in two primary ways:

- Collecting an unrepresentative sample;
  Or
- By incorrect handling of the sample after collection.

The first description is the subject of various separate procedures and a variety of ASTM standards enclosed in this field operations manual. The second category is addressed in this document. The type of analysis for which a sample is being collected determines the type of bottle, holding time, preservative used, and other requirements.

3.1 Sample Containers

Sample containers should be pre-cleaned in accordance with United States Environmental Protection Agency (USEPA) standards. Each container should be affixed with a label to facilitate recording the sample identification. Sample containers should be stored in reasonably clean environments in areas away from contamination. Sample containers should not be stored next to decontamination chemicals, vehicle gas tank access points, or where they may be upset during transportation. Generally speaking, sample containers are best stored at the analytical laboratory until the container is expected to be needed, to minimize chances for contamination.

Container types are usually made of polyethylene plastic, glass, Teflon, or polypropylene plastic. Please refer to the enclosed Table 1 for the proper container type for the chemical parameters being analyzed.

3.2 Holding Times

Based upon chemical and biological processes within the sample itself, holding times may vary for each sample parameter. The holding time is defined as the time from sampling to the time of the analysis. Therefore, it is Andrews Engineering's general policy to ship or deliver samples from the field to the testing laboratory on the day they are collected. This prevents problems due to shipments and laboratory delays from interfering with proper sample analysis.

3.3 Preservations

Cooling of the samples to 4°C retards the biological and chemical degradation of the contaminants in the sample. Cooling the samples is mandatory for volatile and semi-volatile organic samples. Generally speaking, it will be the policy of Andrews Engineering to cool all the samples collected in the field. A common exception to this policy will be process wastestreams where analyses for RCRA metals are being requested.

In addition to cooling samples, the other common types of preservatives are the addition of alkaline or acidic compounds to retard the sample contaminant's degradation. These preservatives are added to liquid samples and not to solid samples. The common forms of these preservatives are listed below:

Acids

Sulfuric Acid (H_2SO_4)
Nitric Acid (HNO_3)
Hydrochloric Acid (HCl)

Alkalines

Sodium Hydroxide (NaOH)

Other Chemicals

Sodium Sulfite ($Na_2S_2O_3$)
Zinc Acetate $Zn(C_2H_3O_2)_2$

NOTE: Often laboratories will provide sample containers that are pre-labeled for the analyses to be conducted. These sample containers provided by laboratories will also contain the appropriate type and amount of chemical preservative. In these instances, it is the responsibility of the field personnel to ensure that sample containers are correctly labeled by the laboratory and that the sample containers contain the appropriate amount of preservative.

4.0 SAMPLE REFERENCE TABLE

Table 1 is furnished in Appendix A to provide an easy reference to select the appropriate sample container, preservative, and holding time for all liquid and solid sampling conducted by Andrews Engineering and its subcontractors.

The use of different containers, preservatives, or maximum holding times may only be modified if the testing laboratory submits a written exception to the provided references. The exception shall include justification for the use of different procedures from those listed herein.

5.0 AIR SAMPLES

Analysis of air samples collected by traps, SEMA canisters, Tedlar bags, etc., are specifically not included in this procedure based upon the various testing and sample collection methodologies, detection limits, etc. It is Andrews Engineering's policy when sampling this media to work with a competent testing laboratory when initially designing the sampling plan.

Appendix A

Sample Volume Requirements, Preservation, and Maximum Holding Times

Table 1
Sample Volume Requirements, Preservation, and Maximum Holding Times

Parameter	Volume (ml)	Container	Preservative	Holding Time
PHYSICAL PROPERTIES				
Color	50	P, G	Cool, 4°C	48 Hours
Conductance	100	P, G	Cool, 4°C	28 Days
Hardness	100	P, G	HNO_3, pH<2	6 Months
Odor	200	G only	Cool, 4°C	24 Hours
pH	25	P, G	None Required	Immediate
Residue				
Total Dissolved Solids	100	P, G	Cool, 4°C	7 Days
Total Suspended Solids	100	P, G	Cool, 4°C	7 Days
Total Solids	100	P, G	Cool, 4°C	7 Days
Total Volatile Solids	100	P, G	Cool, 4°C	7 Days
Settleable Matter	1000	P, G	Cool, 4°C	48 Hours
Temperature	1000	P, G	None Required	Immediate
Turbidity	100	P, G	Cool, 4°C	48 Hours
METALS				
Dissolved	250	P, G	Filter on site HNO_3, pH<2	6 Months
Suspended	250	Filter on site		6 Months
Total	250	P, G	HNO_3, pH<2	6 Months
Chromium (Hexavalent)	250	P, G	Cool, 4°C	24 Hours

Parameter	Volume (ml)	Container	Preservative	Holding Time
Mercury				
Dissolved	250	P,G	Filter HNO_3, pH<2	28 Days
Total	250	P, G	HNO3, pH<2	28 Days
INORGANIC				
Acidity	100	P, G	Cool, 4°C	14 Days
Alkalinity	100	P, G	Cool, 4°C	14 Days
Boron	25	P only	Cool, 4°C	14 Days
Bromide	100	P, G	None Required	28 Days
Chloride	50	P, G	None Required	28 Days
Chlorine	200	P, G	None Required	Immediate
Cyanide	500	P, G	Cool, 4°C NaOH, pH>12 0.6 g ascorbic acid if CL_2 is present	14 Days
Fluoride	500	P, G	None Required	28 Days
Iodide	250	P, G	Cool, 4°C	24 Hours
Nitrogen Ammonia	500	P, G	Cool, 4°C H_2SO_4, pH<2	28 Days
Kjeldahl Nitrogen, Total	500	P, G	Cool, 4°C H_2SO_4, pH<2	28 Days
Nitrate & Nitrite	250	P, G	Cool, 4°C H_2SO_4, pH<2	28 Days
Nitrate	250	P, G	Cool, 4°C	48 Hours
Nitrite	250	P, G	Cool, 4°C	48 Hours
Dissolved Oxygen	300	G btl & top	None required	Immediate
Phosphorus				
Ortho, Dissolved	100	P, G	Filter on site Cool, 4°C	48 Hours

Parameter	Volume (ml)	Container	Preservative	Holding Time
Hydrolyzable	100	P, G	Cool, 4°C H_2SO_4, pH<2	28 Days
Total	100	P, G	Cool, 4°C H_2SO_4, pH<2	28 Days
Total, Dissolved	100	P, G	Cool, 4°C H_2SO_4, pH<2 Filter on site	24 Hours
Silica	100	P only	Cool, 4°C	28 Days
Sulfate	500	P, G	Cool, 4°C	28 Days
Sulfide	500	P, G	Cool, 4°C 2 ml zinc acetate plus NaOH, pH>9	7 Days
Sulfite	100	P, G	None Required	Immed.
ORGANIC				
BOD	500	P, G	Cool, 4°C	48 Hours
COD	50	P, G	Cool, 4°C H_2SO_4, pH<2	28 Days
Oil and Grease	1000	G only	Cool, 4°C H_2SO_4, pH<2	28 Days
Organic Carbon	250	P, G	Cool, 4°C	28 Days
Phenolics	1000	G only	Cool, 4°C H_2SO_4, pH<2	28 Days
MBAS	500	P, G	Cool, 4°C	48 Hours
NTA	100	P, G	Cool, 4°C	24 Hours
TOX	250	G only	Cool, 4°C H_2SO_4, pH<2	8 Days
VOA	40 (2)	G vials	Cool, 4°C	14 Days
Semi-Volatiles	250 (2)	G Teflon	Cool, 4°C	14 days

Notes: *P = Plastic*
G = Glass

Andrews Engineering
Standard Operating Procedures

Decontamination Procedures

Contents

REVISION LOG		
Revision No.	**Description of Recent Revision**	**Pages Affected**

Decontamination Procedures

1.0 SCOPE

This decontamination procedure narrative provides methods for preventing, removing, or reducing undesirable substances (or contaminants) from any personnel, equipment, or gear that have come in contact with soils and/or fluids encountered during investigative and/or sampling activities. These decontamination procedures are also intended to prevent or reduce the chance of cross contamination between sampling sites of unnatural substances present in water or soil. The health and safety protection of site personnel is incorporated and prioritized in the decontamination procedures.

2.0 DECONTAMINATION AREA

When decontamination of drilling or other field equipment and gear is necessary and when appropriate or applicable, an area designated for the activity should be determined. A layout of a typical decontamination area may consist of a minimum of three zones and depends on the chemical parameters of concern. The three zones may include an exclusion zone, a contamination reduction zone, and a support zone. The designation of a specific decontamination area, which is specific to each investigative site, is intended to minimize the generation of impacted waste and limit the spread of contamination. The area of decontamination could be a sufficient distance from the present as well as future boreholes and/or sampling locations.

3.0 DECONTAMINATION/DISPOSAL OF EQUIPMENT AND GEAR

Any equipment that potentially comes in contact with impacted soils or fluids will either require decontaminated or disposal. The equipment that may require decontamination includes equipment of all sizes from small hand held sampling devices and/or inspection tools, to larger downhole drill rig tools; rods, augers, bits, potentially including entire drilling rigs or other heavy equipment. Some field equipment and gear cannot be adequately decontaminated and therefore should be disposed of properly. Examples of equipment and gear to be disposed of properly when necessary include rope, cloth, sampling hoses, wooden blocks, gloves, sample containers, boot covers, and impacted clothing.

4.0 FREQUENCY

To minimize the potential cross contamination of surface and/or subsurface material, the drilling and sampling equipment, and all equipment should be decontaminated before arriving on the site and between locations at the same site. Drill rod (joints), sampling devices, and other equipment that come in direct contact with subsurface formations, waste materials or drilling fluid shall not be greased in any manner.

Additional decontamination may be necessary when advancing into a lower uncontaminated zone after encountering and advancing through an upper contaminated unit. All sampling equipment should be cleaned between samples. Protective gear, such as gloves, boot covers, tyvek suits, etc., may necessitate disposal during each boring/sampling phase and/or between borings/sampling locations to also reduce potential cross contamination.

5.0 FIELD EQUIPMENT

Prior to mobilizing to a project location, the following list of standard materials and equipment should be considered (and obtained as applicable) for the process of decontamination:

Documentation utensils:
- Field log book with writing utensil(s);
- Permanent markers for sample labeling;

Protective gear:
- Applicable protective clothing (i.e. Jeans and long sleeve shirt, water resistant boots, work boots, Tyvek suit, etc.);
- Air purifying respirator (APR) with applicable cartridges;
- Safety glasses with splash guards or splash shield;
- Protective gloves resistant to the constituents of concern;
- Emergency eyewash bottle(s);

Sampling containers:
- Aluminum foil;
- Plastic wrap;
- Sample containers;

Cleansing equipment:
- Long-handled brushes;
- Galvanized metal buckets;
- Galvanized tubs, baby pool, or equivalent;
- High absorbency paper towels;
- Drop cloths and/or plastic sheeting;
- High pressure/steam cleaning apparatus (e.g., steam cleaner, power washer, etc.);

Cleansing fluids/containers:
- Tap/potable water;
- Contaminant-free deionized/distilled water;
- Non-phosphate detergent;
- Selected high purity, contaminant-free solvents;
- Pressurized sprayers, water (e.g., deionized, distilled, potable, etc.) – clearly labeled;
- Pressurized sprayers, solvents – clearly labeled;

Sampling/disposal containers:

- Trash bags;
- Waste containers;and
- Metal/plastic containers for storage and/or disposal of contaminated wash solutions and/or soils.

6.0 PROCEDURAL SUMMARY

The decontamination procedures have been compiled for potential drilling and sampling of boreholes that would be advanced by various methods (e.g., hand auger, hollow stem auger, solid stem auger, rotary core, Hydropunch, GeoProbe, etc.) along with any other media sampling and/or field equipment including personal gear. The procedures are intended to remove or neutralize contaminants that have accumulated on personnel and/or equipment. The process of decontamination for each project should consider the following considerations:

- Location and frequency of decontamination stations;
- Potential decontamination field equipment (See Section 5);
- Applicable and appropriate procedures of decontamination;
- Measures to prevent decontamination of unimpacted areas;
- Procedures to reduce and eliminate contaminant contact with personnel that may occur during removal and sampling of contaminants along with the removal and disposal/decontamination of effected protective clothing/gear.
- Procedures to prevent sample cross contamination while maintaining the sample integrity and custody; and
- Procedures for containerization and/or disposal of impacted soils, fluids, solutions, clothing, equipment, etc.

When determining proper selection of protective clothing, relative to the site conditions and hazards for each project, the process of decontamination may need to be revised in order to protect the health and safety of personnel. The decontamination process requires consideration of various procedures that have been outlined in the following sections.

7.0 REAGENTS: CLEANING SOLUTIONS

The type(s) of solution(s) used in the decontamination process (See Table 7.1) depends on the type and level of contamination present. The following cleaning solutions should be utilized and/or considered as part of the decontamination process:

- Detergent, non-phosphate detergent solution.
    - Alquinox,
    - Liquinox, or
    - Similar solution

- Acid rinse (inorganic desorbing agent – reagent grade)
    - 10% nitric or hydrochloric acid
    - 1 part acid to 10 parts dionized water

- Solvent rinse (organic desorbing agent – pesticide grade)
  - Isopropanol,
  - Acetone, or
  - Methanol

- Control rinse water (e.g. potable water from water system of known chemical composition)

- Deionized water (organic-free)

Table 7.1 Solutions for Decontamination

Type of Hazard	Name of Solution	Remarks
Amphoteric-acids and bases	Sodium bicarbonate	5-15% aqueous solution
Inorganic acids, metal processing wastes, heavy metals	Sodium carbonate	Good water softener, 10-20% aqueous solution
Solvents and organic compounds, oily, greasy unspecified wastes	Trisodium phosphate	Good rinsing solution or detergent, 10% aqueous solution
Pesticides, fungicides, cyanides, ammonia, and other non-acidic inorganic wastes	Calcium hypochlorite	Excellent disinfectant, bleaching and oxidizing agent, 10% aqueous solution

Other Types of Decontamination Solutions

Other Detergents and Aqueous Surfactants
Phosphate-free laboratory detergent (Alconox, Liquinox), Pennsalt 91, Oakite, Gunk, Clorox

Solvents
1,1,2-trichloroethane, H2-ethyl-hexyl acetate, pesticide-grade isopropanol/acetone/ methanol/hexane, heptane (non-hydrogen bonding), alcohol, diesel fuel, naptha, beta-propiolactone, carbon tetrachloride, 8% formalinethylene, 8% hexachloromelamine, 1,2-dichlorethane (in solution), Quadcoat

Other Solutions
10% nitric acid, 0.1 N/10%/20% hydrochloric acid

Water
Potable/tap water (demonstrated to be analyte-free), distilled water, deionized water, reagent grade distilled and deionized water

Source: Ohio EPA (1995).

8.0 PROCEDURES

The purpose of the investigation and the level of QA/QC required by the job specifications will dictate the decontamination process. For example, methods used when investigating known or suspected contamination generally necessitates more stringent practices than when installing a routine monitoring device at a new site.

The choice of procedural activities must be based on their compatibility with the parameters to be removed during decontamination, chemical suitability, and the concentration levels of the parameters anticipated. The process should include an acid rinse when inorganic metals are the contaminant of concern, while a solvent rinse should be incorporated when organics are a contaminant. When the investigation includes more than one contaminant group, the procedure may be complex. It shall be noted that the rinsing agents should not be an analyte of interest.

The decontamination procedure is dependant on whether the equipment comes in contact with the collected sample or not. Samples coming in contact with equipment include devices that undergo physical or chemical testing (i.e. split-spoon, split-barrel, Shelby tube, etc.). Equipment that does not come in contact with samples may include augers, drilling rods, drill rig, etc.; however, these do come into contact with contaminated or potentially contaminated materials. Table 8.1 outlines recommended decontamination order and procedures (ASTM Standard D5088-90).

8.1 Decontamination Methods

The following sections outline the physical and chemical decontamination methods that may be implored during a given investigation.

8.1.1 Physical Decontamination

1. Physical Removal/Scrubbing
2. Air Blasting
3. Wet Blasting
   a. High pressure steam cleaning
   b. Hot water power wash
   c. Hydrolazer
4. Dry Ice Blasting
5. High Pressure Freon Cleaning
6. Ultrasonic Cleaning
7. Vacuum Cleaning
8. Steam Cleaning

8.1.2 Chemical Decontamination

These techniques can involve one or more solutions (See Section 6 and Table 6.1). The following includes the typical minimum decontamination sequence.

1. Scrape or brush the equipment/gear to remove any gross soil or residue.

2. Wash with potable water, deionized water, and/or one or more or a variety of cleaning fluids and detergents (i.e. acetone, etc.).

3. Pressure cleaning (high pressure steam cleaner or water blasting/hydrolazer).

Table 8.1 Decontamination procedures for sampling

EQUIPMENT CONTACTING SAMPLES
• Wash disassembled equipment with non-phosphate detergent and potable water solution. • Rinse thoroughly with potable water. • If more rigorous decontamination is required as a result of a preexisting knowledge of or a suspected subsurface contamination, and samples are being collected for chemical analysis, the following sequence of methods should be followed: – Rinse with 10% hydrochloric or nitric acid when analyzing the subsurface samples for inorganic constituents (note: dilute HNO_3 may oxidize stainless steel). – Rinse thoroughly with deionized/distilled water. – Rinse with a solvent (not an analyte of interest) when analyzing the subsurface samples for organics. The solvent should be pesticide grade isopropanol, acetone, methanol, or hexane, alone or, if required, in some combination. – Note that for equipment with internal mechanism or tubing which cannot be sufficiently cleaned with a brush, decontamination should be conducted by thoroughly circulating the decontamination solution through the item. • Rinse thoroughly with deionized/distilled water. • Air dry thoroughly before using. • Wrap with inert material if equipment is not to be used promptly.
EQUIPMENT NOT CONTACTING SAMPLES
• Steam clean or power wash large equipment, while smaller equipment being hand-washed with brush and detergent solution (generally non-phosphate). • Rinse with potable water. • More rigorous decontamination than described above may be implemented if more stringent QA/QC is required (e.g. known or suspected subsurface contamination.)
SITE CONDITION SPECIFICS
• Decontamination rinse fluids may necessitate containerization or fluid containment depending on site conditions and the disposal arrangement of the material. • Equipment decontamination may require a centralized location (vs. where the equipment was used) as dependant on site conditions. Proper transportation of the equipment to the decontamination area should be conducted to minimize the spread and cross contamination to other soils/water.

9.0 QUALITY CONTROL MEASURES

The quality control measures are intended to provide evidence of cross contamination during the sampling process. In addition, the measures will provide safety procedures for the sampler(s) during the decontamination process to reduce and/or eliminate the health hazards from inhalation, clothing/equipment contact, or direct body contact. The following measures may need to be implemented to ensure proper quality assurance and control (QA/QC) based upon the level of contamination versus the clean up objective or whenever project team members may be concerned.

1. Document the decontamination procedures. The following items should be recorded may also be incorporated in reports as required by the project's particular requirements.
    a. Site location, date, time, and weather.
    b. Type of equipment and sample location.
    c. Location of decontamination.
    d. Individuals conducting the decontamination.
    e. Decontamination methods.
    f. Source of decontamination materials (solutions).
    g. If applicable, the handling of rinse fluids and accumulated solids.
    h. Sampling for QA/QC and QA/QC sample analytical results (field or laboratory).

2. Collect samples to evaluate the completeness of the process.
    a. Collect rinse (field blank) and/or wipe samples to determine base line level of contaminants residing on the equipment/gear.
    b. After the job has been completed, the process should be repeated to determine a final level of contaminants. A final rinse shall be collected and sent to a laboratory for chemical analysis.
    c. The frequency of this evaluation is dependent on project objectives. At a minimum, it is recommended that a QA/QC sample be collected after every tenth wash/rinse or once per day.

3. Follow site specific health and safety measures for the decontamination process, which include at a minimum:
    a. The wearing of goggles or safety glasses (with splash shields), protective (e.g., neoprene, etc.) gloves, and laboratory apron.
    b. Decontamination rinsing using solvents should be in the open air or under fume hood only.
    c. To reduce and/or eliminate hand to mouth contact, no eating, drinking, chewing, or smoking shall be permitted.

10.0 DECONTAMINATION PROCEDURE REFERENCES

Aller, L., T.W. Bennett, G. Hackett, R.J. Petty, J.H. Lehr, H. Sedoris, D.M. Nielsen, and J.E. Denne. 1991. Handbook of Suggested Practices for the Design and Installation of Groundwater Monitoring Wells. Environmental Monitoring Systems Laboratory, Office of Research and Development, U.S. Environmental Protection Agency. Las Vegas, Nevada. EPA/600/4-89/034 (reapproved 1992). In cooperation with the National Water Well Association, Dublin, Ohio).

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Chain-of-Custody

1.0 PURPOSE

This procedure describes the requirements for completion of chain-of-custody records and the maintenance of those records to ensure the integrity of samples from collection to final disposition by documenting possession of transfers.

2.0 SCOPE

This procedure applies to all personnel who perform work activities for Andrews Environmental Engineering, Inc., and its subcontractors. No changes or deviations to this procedure are allowed unless approved in advance by the Program Manager and QA/QC Manager prior to site activities.

3.0 DEFINITIONS

Chain-of-Custody - A process used to document the transfer of custody of samples from one individual to another from collection until final disposition.

Custody Seal - A tape-like seal that is part of the chain-of-custody process and is used to prevent tampering with samples after they have been packed for shipping.

Sample Custody - A sample is under custody if:

- it is in the field personnel's possession; or
- it is in the field personnel's view, after being in their physical possession; or
- it was in the field personnel's physical possession and then it was secured to prevent tampering; or
- it is placed in a designated secure area.

4.0 CHAIN-OF-CUSTODY PROCEDURES

4.1 Initiation and Completion of Chain-of-Custody Form

Chain-of-custody is required for analytical samples to provide traceability of possession from initial sample collection through sample transfer and/or final disposition. Chain-of-custody records also provide sample collection information and document the required analytical testing. The field sampler is responsible for the proper handling and custody of the samples collected until they are properly and formally transferred to another person or the laboratory. To simplify the chain-of-custody record, as few people as possible should handle samples.

Chain-of-custody procedures are also required for transfer of samples between field personnel or between lab personnel in the same work group to ensure the proper tracking of the sample media, as necessary.

All entries on chain-of-custody forms shall be made using indelible ink.

Chain-of-custody forms are typically generated from the laboratory for which the samples are to be delivered to. In the event a laboratory chain-of-custody is not accessible and sampling is required, an equivalent chain-of-custody shall be used. An example of an equivalent chain-of-custody is provided in Appendix A.

Listed below are the steps to be taken to follow chain-of-custody procedures:

Sample Technician or Field Sample Manager

1. Prepare and record the chain-of-custody record prior to sampling with the appropriate information to uniquely identify sample.

2. Enter the following information (prior to sampling event, if possible):
    - Matrix of sample
    - Project number
    - Unique sample identification number
    - Sampling description and location
    - Number of sample containers
    - Storage and preservation requirements
    - Parameters to be analyzed
    - Sample team member
    - Name of the laboratory

Sample Technician

3. Complete the chain-of-custody information at the time of the sampling event by recording the following information at this time:
    - Date and time sampled (military time)
    - Volume of sample (if required for specific analysis and calculations)
    - Any relevant information regarding the sample taken

4. Maintain positive control of samples and forms from collection until transfer to another custodian.

NOTE: "Positive control" requires one or more of the following:
- *physical possession*
- *visual control/oversight*
- *tamper prevention*
- *secured storage (e.g., taping the containers closed, or lock and key if applicable)*

Sample Technician	5. Apply custody seals, if applicable, to each container in a manner such that it can be visibly observed if tampering has occurred.
	NOTE: Some projects designate a Field Sample Manager who collects samples from the sample technicians and distributes or ships the samples to a laboratory. Other projects require the sample technician to distribute or ship the samples directly.
Field Sample Manager or Sample Technician	6a. **IF** the project has a Field Sample Manager to ship samples offsite or deliver the samples directly to an onsite lab: **THEN** ensure completeness of the chain-of-custody **AND** proceed to Step 7
	6b. **IF** the project does **NOT** have a Field Sample Manager, **THEN** provide the delivery and shipment support **AND** proceed to Section 4.2.
Sample Technician	7. Sign the form as "relinquished by" and enter the date and time.
	8. Transfer the samples and the chain-of-custody forms to the Field Sample Manager.
Field Sample Manager	9. Sign the form as "received by" and enter the date and time.
	10. Maintain positive control of samples and forms from collection until transfer to another custodian.

4.2 Initiation and Completion of Sample Labels

Sample labels are required for analytical samples to provide identification of samples collected. All entries on sample labels shall be made using indelible ink. Sample labels are typically provided by the laboratory which will be receiving the samples. In the event the receiving laboratory is not accessible, and sampling is required, an equivalent sample label shall be used.

Sample Technician or Field Sample Manager	1. Prepare and record the sample labels prior to sampling with the appropriate information to uniquely identify sample.
	2. Enter the following information (prior to sampling event, if possible): • Matrix of sample • Project number • Unique sample identification number • Sampling description and location • Storage and preservation requirements • Sample team member • Name of the laboratory

Sample Technician or Field Sample Manager

3. Complete the chain-of-custody information at the time of the sampling event by recording the following information at this time:
    - Date and time sampled (military time)

4.3 Transfers of Samples and Forms to Laboratory Personnel

Sample Technician or Field Sample Manager

1. Ensure completeness of chain-of-custody records.

2. Sign the form as "relinquished by" and enter the date and time.

3a. **IF** the samples will be analyzed at an onsite laboratory,
THEN transfer the samples and the original chain-of-custody forms to the laboratory sample custodian
THEN ensure the laboratory sample custodian assumes possession of the samples **and** signs the form as "received by" **and** enters the date and time
THEN obtain a copy of the chain-of-custody record

3b. **IF** the samples require offsite shipment,
THEN place the original and one copy of the chain-of-custody form in a plastic bag inside the secured shipping container.

4. Package samples according to Department of Transportation (DOT) requirements for shipment to the appropriate laboratory for analysis, with a separate chain-of-custody for each shipment.

5. Process the offsite shipment according to the applicable Department of Transportation (DOT) regulations.

NOTE 1: The date/time will be the same for both signatures when custody is transferred directly to another person. When samples are shipped via common carrier (e.g., Federal Express), the date/time will not be the same for both signatures. Common carriers are not required to sign the chain-of-custody record.

NOTE 2: When samples are shipped to an offsite laboratory, the chain-of-custody record is signed by the laboratory sample custodian and a copy is returned/faxed to the project sample manager.

6. Fax/deliver a copy of the chain-of-custody record to the Sample Manager, if one is used for that project.

Sample Technician or Field Sample Manager	7. Provide a copy of the signed chain-of-custody form to the field sample manager or Project Records Coordinator (as designated by the Program Manager) for temporary retention as a working record.
Project Records Coordinator or Other Designee	8. Maintain the chain-of-custody record in accordance with contract requirements.

5.0 CHAIN-OF-CUSTODY RECORD MAINTENANCE

Chain-of-custody records shall be maintained by the Program Manager and maintained in the project-specific file in accordance with contract requirements.

Appendix A

Sample Chain-of-Custody

ANDREWS
ENGINEERING INC

CHAIN OF CUSTODY RECORD

Client Contact	Laboratory	Project Name:	COC No.: ____ of ____
Andrews Engineering, Inc. 3300 Ginger Creek Drive Springfield, IL 62711 217-787-2334	Lab: Address:	Project No.:	Lab Job No.:
Contact:	Phone: Contact:	TAT: ☐15 BD ☐10 BD ☐5 BD ☐2 BD ____ Other	Sample Temp:
email:	email:	**Sampler:**	

Special Instructions:

ANALYSES

Matrix Key:
- W - Water
- S - Soil
- SL - Sludge
- SE - Sediment
- L - Leachate
- DW - Drinking Water
- OL - Oil
- O - Other

Lab ID	Sample ID	Sample Date	Sample Time	Matrix											Comments

Relinquished by:	Date/Time	Received by:	Date/Time
Relinquished by:	Date/Time	Received by:	Date/Time
Relinquished by:	Date/Time	Received by:	Date/Time

ATTACHMENT N

LPC # 0210600007– Christian County Taylorville/The Paint Shop USEPA #ILD982621690 FOS FILE	LPC # 0210605081– Christian County Taylorville/Evergreen Aviation FOS FILE	R000439

Material Safety Data Sheet

Date of issue 2 June 2014
Version 19.01

1 . Product and company identification

Product name : Aluminum Conditioner
Code : DX503
Supplier : Pretreatment and Specialty Products
23000 St. Clair Avenue
Euclid, OH 44117
Emergency telephone number : (412) 434-4515 (U.S.)
(514) 645-1320 (Canada)
01-800-00-21-400 (Mexico)
Technical Phone Number : 1-800-627-6015 (PPG PRETREATMENT & SPECIALTY PRODUCTS)
8:00 a.m. - 5:00 p.m. EST

2 . Hazards identification

Emergency overview : DANGER!

HARMFUL OR FATAL IF SWALLOWED. MAY BE FATAL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES EYE AND SKIN BURNS. CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. SANDING AND GRINDING DUSTS MAY BE HARMFUL IF INHALED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER. Add this product only to water. Never add water to this product.

Do not breathe vapor or mist. Do not swallow. Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

Potential acute health effects

Inhalation : May be fatal if inhaled. Irritating to respiratory system. Can irritate eyes, nose, mouth and throat. May cause sensitization by inhalation.
Ingestion : Harmful or fatal if swallowed. May cause burns to mouth, throat and stomach.
Skin : Corrosive to the skin. Causes burns. Very toxic in contact with skin. May cause an allergic skin reaction.
Eyes : Corrosive to eyes. Causes burns.

Over-exposure signs/symptoms

NTP, IARC, and OSHA have classified chromium (+6) compounds as carcinogenic. OSHA considers all Cr+6 compounds as potential occupational carcinogens capable of causing lung cancer above the recommended exposure limits.

Medical conditions aggravated by over-exposure : Pre-existing respiratory and skin disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

This Material Safety Data Sheet has been prepared in accordance with Canada's Workplace Hazardous Materials Information System (WHMIS) and the OSHA Hazard Communication Standard (29 CFR 1910.1200).

See toxicological information (Section 11)

3 . Composition/information on ingredients

Name	CAS number	%
chromium (VI) trioxide	1333-82-0	0.5 - 1.5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4 . First aid measures

If ingestion, irritation, any type of overexposure or symptoms of overexposure occur during or persists after use of this product, contact a POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN immediately; have Material Safety Data Sheet information available. Never give anything by mouth to an unconscious or convulsing person.

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek immediate medical attention.

Skin contact : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.

Inhalation : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.

Ingestion : If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do NOT induce vomiting.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Hazardous combustion products : Decomposition products may include the following materials: metal oxide/oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

6 . Accidental release measures

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Do not breathe vapor or mist. Ingestion of product or cured coating may be harmful. Do not swallow. Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Add this product only to water. Never add water to this product. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Name	Result	ACGIH	OSHA	Ontario	Mexico	PPG
chromium (VI) trioxide	TWA	0.05 mg/m³ (measured as Cr) 0.05 MG/M3 TD	0.005 mg/m³ (as Cr) 5 mg/m3	0.05 mg/m³ (as Cr)	0.05 mg/m³	0.005 mg/m³
	STEL	Not established	1 mg/10m³ Z C	Not established	Not established	Not established

Key to abbreviations

A = Acceptable Maximum Peak
ACGIH = American Conference of Governmental Industrial Hygienists.
C = Ceiling Limit
F = Fume
IPEL = Internal Permissible Exposure Limit
OSHA = Occupational Safety and Health Administration.
R = Respirable
Z = OSHA 29CFR 1910.1200 Subpart Z - Toxic and Hazardous Substances
S = Potential skin absorption
SR = Respiratory sensitization
SS = Skin sensitization
STEL = Short term Exposure limit values
TD = Total dust
TLV = Threshold Limit Value
TWA = Time Weighted Average

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Engineering measures : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

8. Exposure controls/personal protection

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Eyes : Chemical splash goggles and face shield.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Gloves : nitrile, neoprene

Respiratory : By spraying: air-fed respirator. By other operations than spraying, in well ventilated areas, air-fed respirators could be replaced by a combination charcoal filter and particulate filter mask. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state	: Liquid.
Flash point	: Closed cup: Not applicable.
Color	: Not available.
Odor	: Not available.
pH	: 2.3
Boiling/condensation point	: >37.78°C (>100°F)
Melting/freezing point	: Not available.
Specific gravity	: 1.01
Density (lbs / gal)	: 8.43
Vapor pressure	: 2.3 kPa (17.5 mm Hg) [room temperature]
Vapor density	: Not available.
Volatility	: 99% (v/v), 97.95% (w/w)
Evaporation rate	: 0.36 (butyl acetate = 1)
Partition coefficient: n-octanol/water	: Not available.
% Solid. (w/w)	: 2.05

10 . Stability and reactivity

Stability	: Stable under recommended storage and handling conditions (see Section 7).
Conditions to avoid	: No specific data.
Materials to avoid	: Reactive or incompatible with the following materials:.acids,oxidizing materials,strong alkalis
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Hazardous polymerization	: Under normal conditions of storage and use, hazardous polymerization will not occur.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
chromium (VI) trioxide	LD50 Oral LD50 Dermal LC50 Inhalation Dusts and mists	Rat Rabbit Rat	0.052 g/kg 0.057 g/kg 217 mg/m3	- - 4 hours

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Target organs : Contains material which may cause damage to the following organs: blood, kidneys, liver, upper respiratory tract, skin, eyes.

Carcinogenicity

Carcinogenicity : Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.

Classification

Product/ingredient name	ACGIH	IARC	NTP	OSHA
chromium (VI) trioxide	A1	1	Known to be a human carcinogen.	+

Carcinogen Classification code: ACGIH: A1, A2, A3, A4, A5
IARC: 1, 2A, 2B, 3, 4
NTP: Proven, Possible
OSHA: +
Not listed or regulated as a carcinogen: -

Mutagenicity

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

13 . Disposal considerations

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees. Section 6. Accidental release measures

14. Transport information

	DOT	TDG	Mexico	IMDG
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.
Marine pollutant substances	Not applicable.	Not applicable.	Not applicable.	Not applicable.

Additional information

DOT : None identified.
TDG : None identified.
Mexico : None identified.
IMDG : None identified.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

15 . Regulatory information

United States inventory (TSCA 8b) : All components are listed or exempted.
Australia inventory (AICS) : All components are listed or exempted.
Canada inventory (DSL) : All components are listed or exempted.
China inventory (IECSC) : All components are listed or exempted.
Europe inventory (REACH) : Please contact your supplier for information on the inventory status of this material.
Japan inventory (ENCS) : All components are listed or exempted.
Korea inventory (KECI) : All components are listed or exempted.
New Zealand (NZIoC) : All components are listed or exempted.
Philippines inventory (PICCS) : All components are listed or exempted.

<u>United States</u>

U.S. Federal regulations :

SARA 302/304: nitric acid

CERCLA: Hazardous substances.: nitric acid: 1000 lbs. (454 kg); chromium (VI) trioxide: No RQ is being assigned to the generic or broad class.; ammonium bifluoride: 100 lbs. (45.4 kg); tripotassium hexacyanoferrate: No RQ is being assigned to the generic or broad class.;

SARA 311/312 SDS Distribution - Chemical Inventory - Hazard Identification:

Chemical name	CAS #	Acute	Chronic	Fire	Reactive	Pressure
chromium (VI) trioxide	1333-82-0	Y	Y	N	Y	N
	Product as-supplied :	Y	Y	N	N	N

15 . Regulatory information

SARA 313	Chemical name	CAS number	Concentration
Supplier notification	: chromium (VI) trioxide	1333-82-0	0.5 - 1.5

Additional environmental information is contained on the Environmental Data Sheet for this product, which can be obtained from your PPG representative.

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

Canada

WHMIS (Canada) : Class E: Corrosive liquid. Class D-1A: Material causing immediate and serious toxic effects (Very toxic). Class D-1B: Material causing immediate and serious toxic effects (Toxic). Class D-2A: Material causing other toxic effects (Very toxic). Class D-2B: Material causing other toxic effects (Toxic).

Mexico

Classification

Flammability : 0 Health : 4 Reactivity : 0

16 . Other information

Hazardous Material Information System (U.S.A.)

Health : 4 * Flammability : 0 Physical hazards : 0
(*) - Chronic effects

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

Health : 4 Flammability : 0 Instability : 0

Date of previous issue : 3/29/2014.

Organization that prepared the MSDS : EHS

▼ Indicates information that has changed from previously issued version.

Disclaimer

The information contained in this data sheet is based on present scientific and technical knowledge. The purpose of this information is to draw attention to the health and safety aspects concerning the products supplied by PPG, and to recommend precautionary measures for the storage and handling of the products. No warranty or guarantee is given in respect of the properties of the products. No liability can be accepted for any failure to observe the precautionary measures described in this data sheet or for any misuse of the products.

Townsend, Steve

To: Townsend, Steve
Subject: FW: Brandis Info
Attachments: Brandis Deeds.pdf

LPC # 0210600007– Christian County
Taylorville/The Paint Shop
USEPA #ILD982621690
FOS FILE

LPC # 0210605081– Christian County
Taylorville/Evergreen Aviation
FOS FILE

ATTACHMENT O

From: Joe Stepping [mailto:jstepping@ccsolidwaste.com]
Sent: Wednesday, May 14, 2014 2:44 PM
To: Townsend, Steve
Subject: Brandis Info

I was unable to locate any incorporation paperwork at the courthouse. Tax bills continue to go to Evergreen Aviation Inc. but I can't find any documents showing the officers of the corporation. I have attached the deeds for the 3 parcels at the airport. Let me know if I can do anything else.

Joe Stepping,
Department Head

CHRISTIAN COUNTY SOLID-WASTE MANAGEMENT DEPARTMENT

214 W. Market St.
Taylorville, IL 62568
Phone: 217-287-2334

Townsend, Steve

From: Joe Stepping <jstepping@ccsolidwaste.com>
Sent: Tuesday, June 17, 2014 10:01 AM
To: Townsend, Steve
Subject: More Brandis Deeds
Attachments: Brandis 400 004.pdf; Brandis 400 006.pdf

There are 4 additional deeds attached for the 2 parcels you inquired about Steve. The 400-006 parcel has 3 deeds, 1 from 1995 and 2 from 1999. The 2012 deed is for the 400-006 parcel. Let me know if you need anything else.

Joe Stepping,
Department Head

CHRISTIAN COUNTY SOLID-WASTE MANAGEMENT DEPARTMENT

214 W. Market St.
Taylorville, IL 62568
Phone: 217-287-2334

R000448

Christian County Supervisor of Assessments
101 S. Main
Taylorville, IL 62568
(217) 824-5900

Parcel Information

Parcel Number:	17-13-32-400-004-00
Primary Name:	EVERGREEN AVIATION INC
Primary Address:	2301 S SPRESSER ST TAYLORVILLE, IL 62568

Property Information

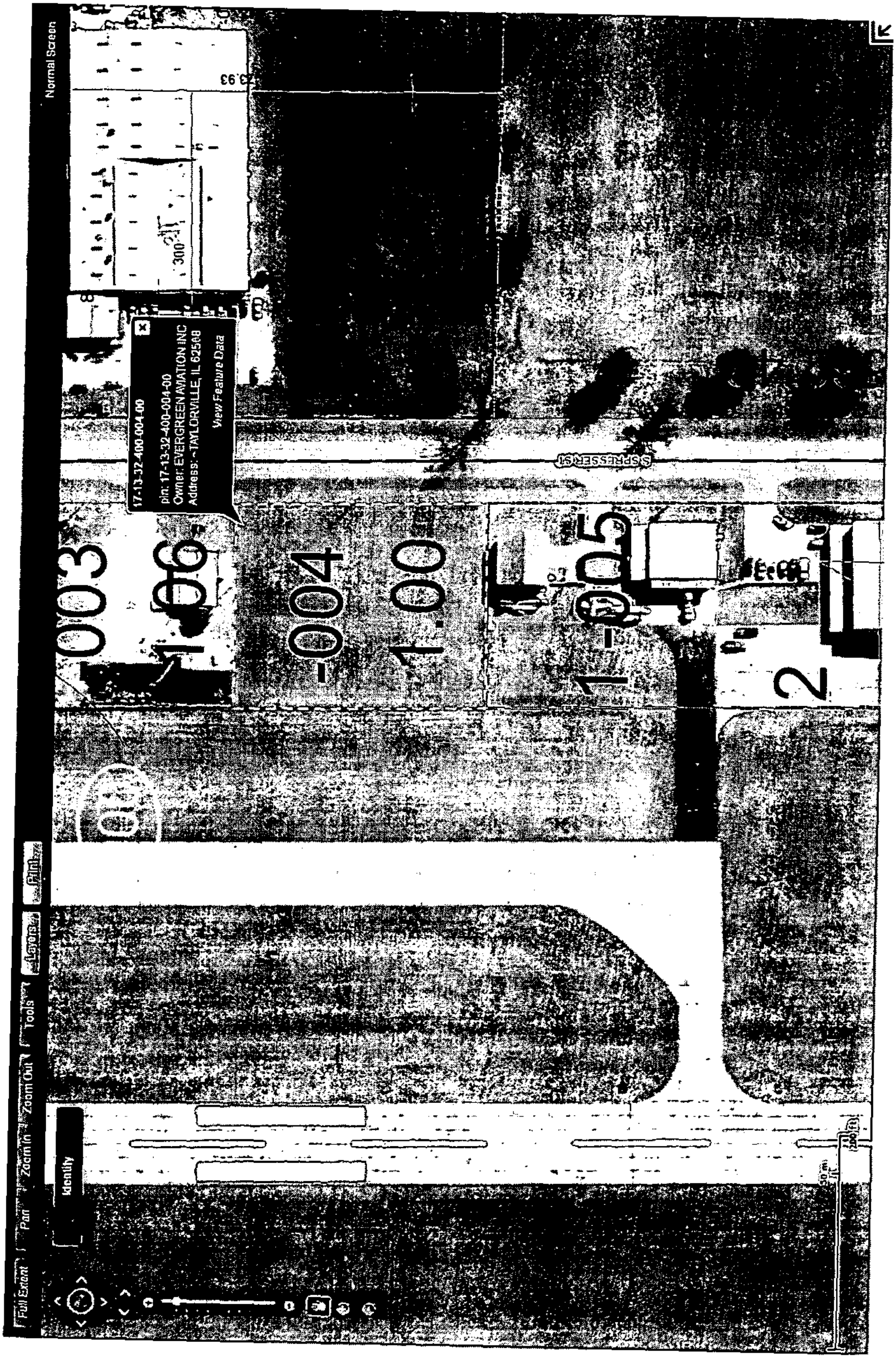
Site Address:	TAYLORVILLE, IL 62568
Tax Code:	550
Section Lot:	32
Legal Township:	13
Range Block:	2W
Subdivision:	
Township Name:	TAYLORVILLE

Assessment Information

Acres:	1.0000
Land:	5910
Farm Land:	0
Building:	0
Farm Building:	0
Use Code:	63
Use Description:	

Exemption Information

Owner Occupied:	No
Elderly:	No
Senior Freeze:	No
Improvement:	No
Veterans:	No
Developers:	No
Partial Exemption:	No
Returning Veteran:	No
Disabled Person:	No
Vet 50% Disabled:	No
Vet 75% Disabled:	No
Year Beginning:	No
Year Retired:	No



Normal Screen
Full Extent
Pan
Zoom In
Zoom Out
Tools
Layers
Print
Identify
17-13-32-400-004-00
pin: 17-13-32-400-004-00
Owner: EVERGREEN AVIATION INC
Address: ~TAYLORVILLE, IL 62568
View Feature Data
S SPRESSER ST
-003
-004
1.00
1-005
2

ST-20381

2012R04250 4
2012R04250
LINDA CURTIN
CHRISTIAN COUNTY RECORDER
TAYLORVILLE, IL
RECORDED ON
07/30/2012 01:49PM
PAGES: 4 IZATT
REC FEE: 12.00
AUTO FEE: 18.00
GIS FEE: 20.00
RHSP FEE: 9.00
RHSP CO FEE: 0.50
RHSP REC FEE: 0.50

Mail Tax Statements To:
(Name and Address)

Evergreen Aviation Inc
2301 S. Spresser St.
Taylorville, IL 62568

WARRANTY DEED

NAME OF GRANTOR	ADDRESS
John M. Kennedy,	918 Mesa Verde Ct. Taylorville, IL 62568

for and in consideration of more than one hundred dollars in hand paid, conveys and warrants to:

NAME OF GRANTEE	ADDRESS
Evergreen Aviation Inc., a Delaware Corporation,	2301 S. Spresser St. Taylorville, IL 62568

the following described real estate:

A part of the Southeast Quarter of Section 32, Township 13 North, Range 2 West of the Third Principal Meridian, Christian County, Illinois, more particularly described as follows: Beginning at a drilled hole at the center of an "x" cut in the concrete pavement at the east quarter section corner of said Section 32, thence south along the east side of Section 32, a distance of 426.13 feet to a drilled hole at the center of an "x" cut in the concrete pavement, said drilled hole being the true point of beginning; thence continue south 226.13 feet along said east side of Section 32 to a drilled hole at the center of an "x" cut in the concrete pavement; thence westerly along a line 652.26 feet southerly from and parallel with the east-west quarter section line of Section 32 aforesaid a distance of 230.92 feet to an iron pipe; thence north 226.13 feet along a line 230.92 feet westerly from and parallel with the east side of said Section 32 to an iron pipe set over a Re-Bar; thence easterly along a line 426.13 feet southerly from and parallel with the quarter section line of Section 32 aforesaid to the true point of beginning a distance of 230.92 feet more or less; situated in Christian County, Illinois.

State $14.00 Co. $7.00 Total $21.00

STATE OF ILLINOIS
STATE TAX
JUL.30.12
CHRISTIAN COUNTY
\# 0000000537
REAL ESTATE TRANSFER TAX
0002100
FP654321

Subject to taxes for 2011 and thereafter,
Subject to easements and restrictions of record or in place.
Except coal and other minerals if and to the extent heretofore conveyed, reserved or excepted.

which is situated in the County of Christian, in the State of Illinois, hereby releasing and waiving all rights under and by virtue of the Homestead Exemption Laws of this State.

Grantor warrants that the above-described real estate is not subject to an estate of homestead in Grantor or Grantor's spouse, or partner in a civil union, if any.

July 24, 2012

John M. Kennedy

John M. Kennedy

STATE OF Colorado :
: SS
COUNTY OF Pitkin :

I, the undersigned, a Notary Public, in and for said County, in the State aforesaid, Do Hereby Certify, that John M. Kennedy personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act, for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

NOTARY PUBLIC
CARA L.
HAGGAN
STATE OF COLORADO

Given under my hand and official seal, July 24, 2012.

My Commission Expires 02/08/2015

Cara L. Haggan

NOTARY PUBLIC

This Instrument Was Prepared By:

Daniel W. Austin
210 South Washington Street
Taylorville, IL 62568

TO BE FILED WITH THE CHRISTIAN COUNTY CLERK & RECORDER

AFFIDAVIT FOR PURPOSE OF ILLINOIS PLAT ACT REQUIREMENTS
THIS IS A LEGAL DOCUMENT – PLEASE CONSULT YOUR ATTORNEY

(Zoning & Subdivision Ordinances May Also Apply)

Except as otherwise indicated below, whenever the owner of land subdivides it into 2 or more parts, any of which is less than 5 acres, he must have it surveyed and a subdivision plat thereof made by an Illinois Registered Land Surveyor - 765 ILCS 205/1(a). If a plat is made by an Illinois Registered Surveyor of any parcel or tract of land otherwise exempt from the plat provisions of this Act as indicated below, such plat shall be recorded - 765 ILCS 205/1(c). When a property is divided into parcels so that it cannot be described without describing it by metes and bounds, it is the duty of the owner to have the land surveyed and platted into lots. The platting shall be in accord with the Plat Act. The plat shall be certified and recorded - 35 ILCS 200/9-55.

AFFIANT is the Grantor or is the Grantor's authorized representative in a deed transferring interest in the real estate described in the accompanying deed. AFFIANT further states this transfer is exempt from the Illinois Plat Act (765 ILCS 205) because of the following:

☒ NOT A DIVISION OF LAND – PARCEL BOUNDARIES REMAIN UNCHANGED

☐ A DIVISION OF LAND THAT MEETS ONE OF THE FOLLOWING EXCEPTIONS – APPROVAL BY COUNTY PLAT OFFICER (OR DESIGNEE) OR COUNTY BOARD IS REQUIRED ALONG WITH APPLICABLE FEE PRIOR TO RECORDING:

- ☐ The division or subdivision of land into parcels or tracts of 5 acres or more in size which **does not involve any new streets or easements of access.**
- ☐ The division of lots or blocks of less than 1 acre in any recorded subdivision which **does not involve any new streets or easements of access.**
- ☐ The sale or exchange of parcels of land between owners of adjoining and contiguous land.
- ☐ The conveyance of parcels of land or interests therein for use as a right of way for railroads or other public utility facilities and other pipe lines which **does not involve any new streets or easements of access.**
- ☐ The conveyance of land owned by a railroad or other public utility which **does not involve any new streets or easements of access.**
- ☐ The conveyance of land for highway or other public purposes or grants or conveyances relating to the dedication of land for public use or instruments relating to the vacation of land impressed with a public use.
- ☐ Conveyances made to correct descriptions in prior conveyances.
- ☐ The sale or exchange of parcels or tracts of land following the division into no more than 2 parts of a particular parcel or tract of land existing on July 17, 1959 and **not involving any new streets or easements of access.**
- ☐ The sale of a single lot of less than 5 acres from a larger tract when a survey is made by an Illinois Registered Land Surveyor; provided, that this exemption shall not apply to the sale of any subsequent lots from the same larger tract of land, as determined by the dimensions and configuration of the larger tract on October 1, 1973, and provided also that this exemption does not invalidate any local requirements applicable to the subdivision of land.
- ☐ The preparation of a plat for wind energy devices under Section 10-620 of the Property Tax Code.

☐ A DIVISION OF LAND NOT MEETING ONE OF THE ABOVE EXCEPTIONS – APPROVAL BY COUNTY PLAT OFFICER (OR DESIGNEE) OR COUNTY BOARD IS REQUIRED ALONG WITH APPLICABLE FEE PRIOR TO RECORDING

All divisions requiring a metes and bounds description must be surveyed and a plat prepared by an Illinois Licensed Professional Land Surveyor shall be recorded.

Surveyor's Name:______________________________ Phone:______________________

Who wrote the legal description? (If different from above)

Name:______________________________ Phone:______________________

ANY division within County jurisdiction must be reviewed by the County Plat Officer (or Designee) or County Board.

(OVER)

If the property is located within a municipality or within 1.5 miles of the corporate boundary, local ordinances may apply. For your protection, it is required that the AFFIANT advise the participating municipality to review and approve this division, if necessary.

Indicate the municipality(s) with jurisdiction (if applicable): ______________________

Municipal Representative's Signature	*Print Name*	*Date*
Municipal Representative's Signature	*Print Name*	*Date*

I swear to the best of my knowledge that the statements contained herein are true and correct. AFFIANT further states that __he makes this affidavit for the purpose of indicating to THE RECORDER OF DEEDS OF CHRISTIAN COUNTY, ILLINOIS, that the conveyance by the attached instrument is within, and in compliance with, the provisions of the Illinois Plat Act.

NAME: John M. Kennedy SIGNATURE: John M. Kennedy DATE: JULY 24, 2012

NOTARY PUBLIC CARA L. HAUGAN STATE OF COLORADO

My Commission Expires 02/08/2015

Subscribed and sworn to before me this 24 day of July, 2012

Cara L. Haugan

Notary Public

Approval for State Plat Act and County Subdivision Ordinance Purposes:

SURVEY REQUIRED FOR RECORDING ☐

Christian County Plat Officer:______________________ **Date:**______________
or Designee

PIN:______________________

IMPORTANT! ANY PARCEL DIVISION THAT OCCURS PARTIALLY OR WHOLLY WITHIN A DRAINAGE DISTRICT MUST HAVE THE CORRESPONDING DRAINAGE ASSESSMENTS CERTIFIED TO THE COUNTY CLERK PRIOR TO THE SUPERVISOR OF ASSESSMENTS DIVIDING THE PROPERTY FOR TAX PURPOSES.

FOR COUNTY PLAT OFFICER APPROVAL MAKE CHECKS PAYABLE TO: CHRISTIAN COUNTY

PLEASE BE ADVISED THAT ADDITIONAL ZONING AND HEALTH DEPARTMENT COMPLIANCE MAY BE REQUIRED

R000454

Christian County Supervisor of Assessments
101 S. Main
Taylorville, IL 62568
(217) 824-5900

Parcel Information

Parcel Number:	17-13-32-400-005-00
Primary Name:	BRANDIS ROBERT J BRANDIS MICHAEL J
Primary Address:	2301 S SPRESSER ST TAYLORVILLE, IL 62568-0000

Property Information

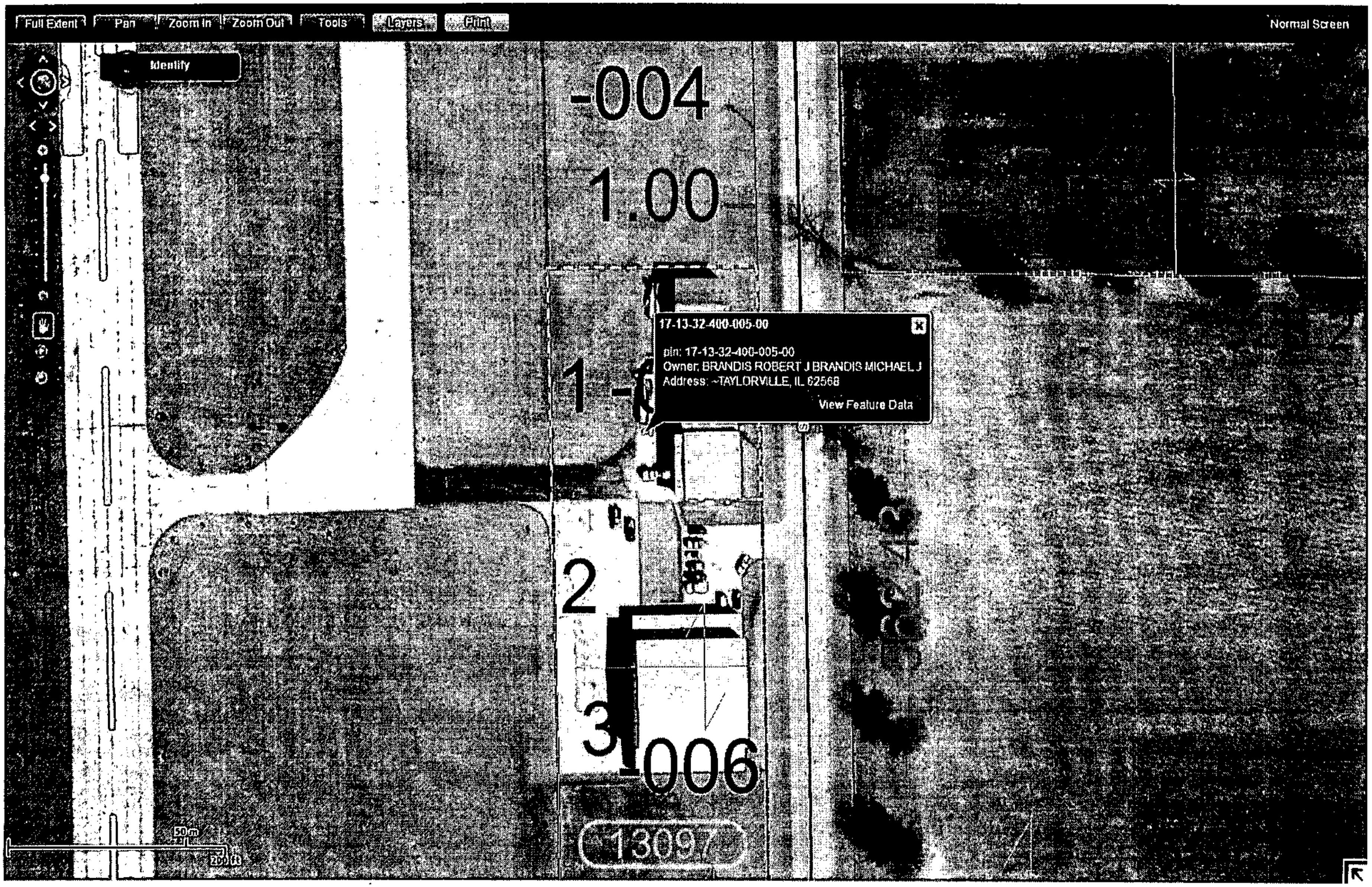
Site Address:	TAYLORVILLE, IL 62568
Tax Code:	540
Section Lot:	32
Legal Township:	13
Range Block:	2W
Subdivision:	SUMMERS SUB
Township Name:	TAYLORVILLE

Assessment Information

Acres:	0.0000
Land:	5910
Farm Land:	0
Building:	16331
Farm Building:	0
Use Code:	60
Use Description:	

Exemption Information

Owner Occupied:	No
Elderly:	No
Senior Freeze:	No
Improvement:	No
Veterans:	No
Developers:	No
Partial Exemption:	No
Returning Veteran:	No
Disabled Person:	No
Vet 50% Disabled:	No
Vet 75% Disabled:	No
Year Beginning:	No
Year Retired:	No


Full Extent
Pan
Zoom In
Zoom Out
Tools
Layers
Print
Normal Screen
Identify
-004
1.00
1-
2
3
006
13097
17-13-32-400-005-00
pin: 17-13-32-400-005-00
Owner: BRANDIS ROBERT J BRANDIS MICHAEL J
Address: ~TAYLORVILLE, IL 62568
View Feature Data
50 m
200 ft

2012R06658 4
2012R06658
LINDA CURTIN
CHRISTIAN COUNTY RECORDER
TAYLORVILLE, IL
RECORDED ON
12/05/2012 01:57PM
PAGES: 4 DK
REC FEE: 12.00
AUTO FEE: 18.00
GIS FEE: 20.00
RHSP FEE: 9.00
RHSP CO FEE: 0.50
RHSP REC FEE: 0.50

THIS INSTRUMENT PREPARED BY:
David R. Fines
Attorney at Law
211 West Main Cross
Taylorville, Illinois 62568
(217) 824-8883

MAIL TAX STATEMENTS TO:
Robert J. Brandis and
Michael J. Brandis
2301 South Spresser Street
Taylorville, IL 62568

DEED IN TRUST

Name and Address of Grantor

Robert J. Brandis, a Divorced Person not since remarried
2301 South Spresser Street
Taylorville, IL 62568

FOR AND IN CONSIDERATION OF THE SUM OF ONE DOLLAR AND OTHER GOOD AND VALUABLE CONSIDERATION IN HAND PAID, THE RECEIPT AND SUFFICIENCY OF WHICH ARE HEREBY ACKNOWLEDGED, CONVEYS AND WARRANTS TO:

Name and Address of Grantee

Peoples Bank & Trust, a banking Corporation, as Trustee of Land Trust Agreement No. 3835 dated November 7, 2012
P.O. Box 620
Taylorville, IL 62568

THE FOLLOWING DESCRIBED REAL ESTATE SITUATED IN CHRISTIAN COUNTY, ILLINOIS:

Lot 1 of Summer's Subdivision situated in a part of the Southeast Quarter of Section 32, Township 13 North, Range 2 West of the Third Principal Meridian, as shown on the Plat of said subdivision recorded with the Christian County Recorder in Plat Book 5 at Page 318.

Common Address: 2301 South Spresser Street, Taylorville, IL 62568
PIN No.: 17-13-32-400-005

NOTE: This transaction is exempt by virtue of the provisions of 35 ILCS 200/31-45(e). (Real Estate Transfer Tax Law)

11/7/12
Date

Agent

The Trustee shall have and hold said premises and all improvements in trust for the uses and purposes set forth in the land trust agreement referred to above.

Grantor certifies that the above described real estate is not subject to an estate of homestead.

Dated the 7th day of November, 2012.

ROBERT J. BRANDIS

STATE OF ILLINOIS)
) SS
COUNTY OF CHRISTIAN)

I, the undersigned Notary Public, in and for said County in the State aforesaid, do hereby certify that **ROBERT J. BRANDIS,** personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed, and delivered the said instrument as his free and voluntary act, for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and seal this 7th day of November, 2012.

"OFFICIAL SEAL"
LORI NATION
NOTARY PUBLIC
STATE OF ILLINOIS
MY COMMISSION EXPIRES 6-20-2016

Lori Nation
Notary Public

TO BE FILED WITH THE CHRISTIAN COUNTY CLERK & RECORDER

R000458

AFFIDAVIT FOR PURPOSE OF ILLINOIS PLAT ACT REQUIREMENTS
THIS IS A LEGAL DOCUMENT — PLEASE CONSULT YOUR ATTORNEY

(Zoning & Subdivision Ordinances May Also Apply)

Except as otherwise indicated below, whenever the owner of land subdivides it into 2 or more parts, any of which is less than 5 acres, he must have it surveyed and a subdivision plat thereof made by an Illinois Registered Land Surveyor - 765 ILCS 205/1(a). If a plat is made by an Illinois Registered Surveyor of any parcel or tract of land otherwise exempt from the plat provisions of this Act as indicated below, such plat shall be recorded - 765 ILCS 205/1(c). When a property is divided into parcels so that it cannot be described without describing it by metes and bounds, it is the duty of the owner to have the land surveyed and platted into lots The platting shall be in accord with the Plat Act. The plat shall be certified and recorded - 35 ILCS 200/9-55.

AFFIANT is the Grantor or is the Grantor's authorized representative in a deed transferring interest in the real estate described in the accompanying deed AFFIANT further states this transfer is exempt from the Illinois Plat Act (765 ILCS 205) because of the following:

- ☒ NOT A DIVISION OF LAND — PARCEL BOUNDARIES REMAIN UNCHANGED
- ☐ A DIVISION OF LAND THAT MEETS ONE OF THE FOLLOWING EXCEPTIONS:
  - ☐ The division or subdivision of land into parcels or tracts of 5 acres or more in size which **does not involve any new streets or easements of access.**
  - ☐ The division of lots or blocks of less than 1 acre in any recorded subdivision which **does not involve any new streets or easements of access.**
  - ☐ The sale or exchange of parcels of land between owners of adjoining and contiguous land.
  - ☐ The conveyance of parcels of land or interests therein for use as a right of way for railroads or other public utility facilities and other pipe lines which **does not involve any new streets or easements of access.**
  - ☐ The conveyance of land owned by a railroad or other public utility which **does not involve any new streets or easements of access.**
  - ☐ The conveyance of land for highway or other public purposes or grants or conveyances relating to the dedication of land for public use or instruments relating to the vacation of land impressed with a public use
  - ☐ A conveyance made to correct a description in a prior conveyance.
  - ☐ *The sale or exchange of parcels or tracts of land following the division into no more than 2 parts of a particular parcel or* tract of land existing on July 17, 1959 and **not involving any new streets or easements of access.**
  - ☐ The sale of a single lot of less than 5 acres from a larger tract when a survey is made by an Illinois Registered Land Surveyor; provided, that this exemption shall not apply to the sale of any subsequent lots from the same larger tract of land, as determined by the dimensions and configuration of the larger tract on October 1, 1973, and provided also that this exemption does not invalidate any local requirements applicable to the subdivision of land.
  - ☐ The preparation of a plat for wind energy devices under Section 10-620 of the Property Tax Code
- ☐ A DIVISION OF LAND NOT MEETING ONE OF THE ABOVE EXCEPTIONS — APPROVAL BY COUNTY PLAT OFFICER (OR DESIGNEE) OR COUNTY BOARD IS REQUIRED

All divisions requiring a metes and bounds description must be surveyed and a plat prepared by an Illinois Licensed Professional Land Surveyor shall be recorded

Surveyor's Name: ______________________ Phone: ______________

Who wrote the legal description? (If different from above)

Name: ______________________ Phone. ______________

Any division within County jurisdiction that results in a parcel of less than 2 acres must be reviewed by the County Plat Officer or County Board. (OVER)

If the property is located within a municipality or within 1 5 miles of the corporate boundary, local ordinances may apply. For your protection, it is required that the AFFIANT advise the participating municipality to review and approve this division, if necessary.

Indicate the municipality(s) with jurisdiction (if applicable): ______________________

Municipal Representative 's Signature	*Print Name*	*Date*
Municipal Representative's Signature	*Print Name*	*Date*

Under the penalties of perjury, I swear that the statements contained herein are true and correct AFFIANT further states that he makes this affidavit for the purpose of indicating to THE RECORDER OF DEEDS OF CHRISTIAN COUNTY, ILLINOIS, that the conveyance by the attached instrument is within, and in compliance with, the provisions of the Illinois Plat Act.

NAME: David R Fines SIGNATURE: David R Fines DATE: 10/9/12

Subscribed and sworn to before me this 9th day of October, 2012.

"OFFICIAL SEAL"
LORI NATION
NOTARY PUBLIC
STATE OF ILLINOIS
MY COMMISSION EXPIRES 8-20-2016

Lori Nation
Notary Public

Approval for State Plat Act and County Subdivision Ordinance Purposes.
Christian County Plat Officer: ______________________ **Date:** ______________
or Designee

<u>PLEASE BE ADVISED THAT ADDITIONAL ZONING AND HEALTH DEPARTMENT COMPLIANCE MAY BE REQUIRED</u>

R000460

Christian County Supervisor of Assessments
101 S. Main
Taylorville, IL 62568
(217) 824-5900

Parcel Information

Parcel Number:	17-13-32-400-006-00
Primary Name:	EVERGREEN AVIATION INC
Primary Address:	2301 S SPRESSER ST TAYLORVILLE, IL 62568-9291

Property Information

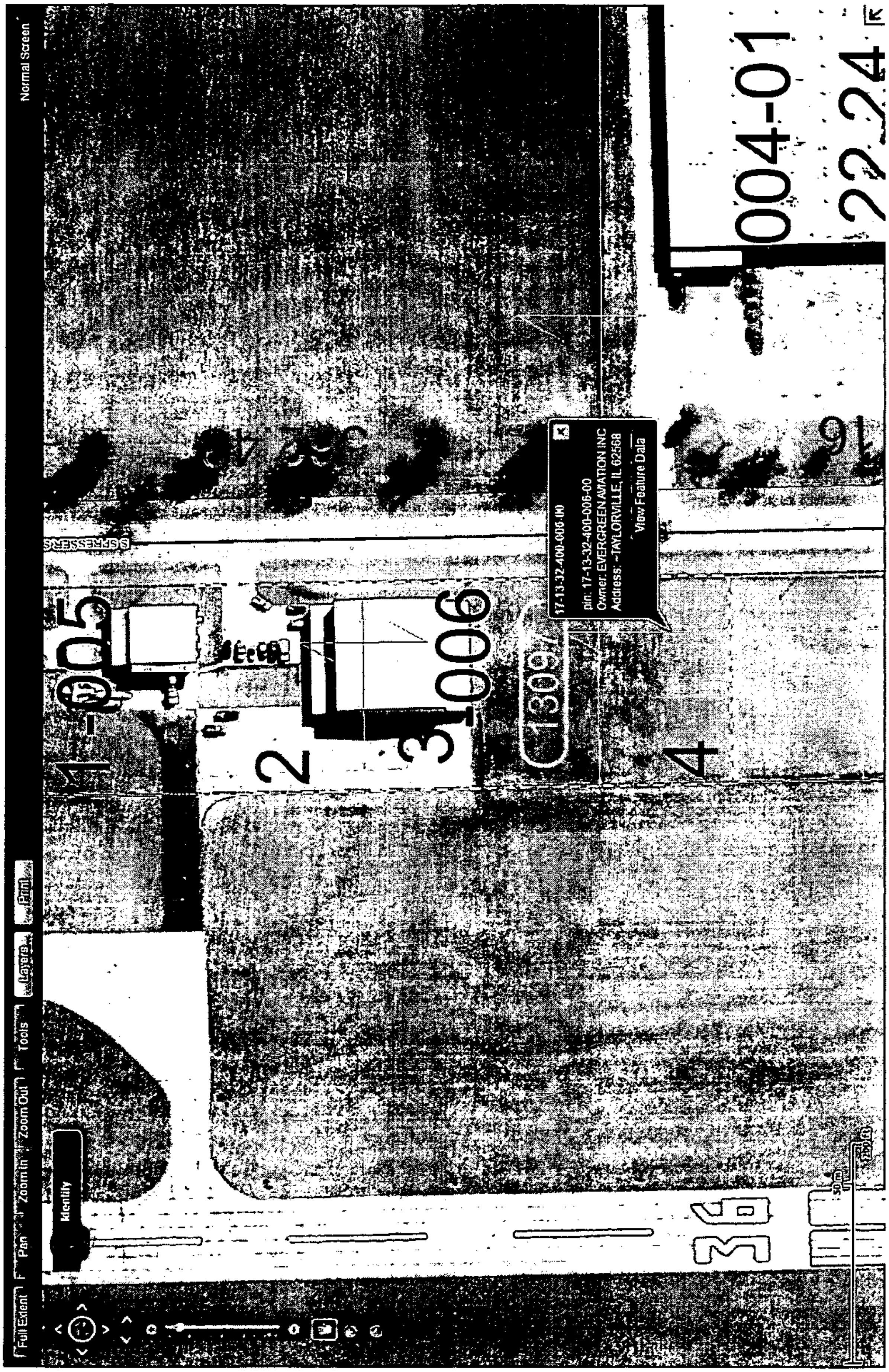
Site Address:	TAYLORVILLE, IL 62568
Tax Code:	540
Section Lot:	32
Legal Township:	13
Range Block:	2W
Subdivision:	SUMMERS SUB
Township Name:	TAYLORVILLE

Assessment Information

Acres:	0.0000
Land:	8731
Farm Land:	0
Building:	45478
Farm Building:	0
Use Code:	60
Use Description:	

Exemption Information

Owner Occupied:	No
Elderly:	No
Senior Freeze:	No
Improvement:	No
Veterans:	No
Developers:	No
Partial Exemption:	No
Returning Veteran:	No
Disabled Person:	No
Vet 50% Disabled:	No
Vet 75% Disabled:	No
Year Beginning:	No
Year Retired:	No



Normal Screen
Full Extent
Pan
Zoom In
Zoom Out
Tools
Layers
Print
Identify
17-13-32-400-006-00
pin: 17-13-32-400-006-00
Owner: EVERGREEN AVIATION INC
Address: ~TAYLORVILLE, IL 62568
View Feature Data
S SPRESSER S
1-005
006
1309
004-01
36

1995R2029

R000462

Terry E. Ryan

TERRY E. RYAN
CHRISTIAN CO. REC.

State 11^{00} Co 5^{50} Total 16^{50}

'95 APR 28 PM 3 19

FOR RECORDER'S USE

TAX ID: 17-13-32-400-006
WARRANTY DEED - STATUTORY FORM

Grantee: Evergreen Aviation, Inc.
Route 48 West
Taylorville, IL 62568

Tax Bill to: Evergreen Aviation, Inc.
Route 48 West
Taylorville, IL 62568

THE GRANTORS, MARY HENRIETTA BARNES, A WIDOW, NOT SINCE REMARRIED, LAURIE LYNN BARNES O'BRIEN, A MARRIED PERSON, JAMES MICHAEL BARNES, A DIVORCED PERSON NOT SINCE REMARRIED, SHARON LESLIE BARNES HAASIS, A MARRIED PERSON, DAVID BRUCE BARNES, A SINGLE PERSON AND CHRISTOPHER CULLEN BARNES, A MARRIED PERSON, being all of the heirs of Ronald D. Barnes, deceased, of the Cities of Taylorville, Springfield and Chanhassen, Counties of Christian, Sangamon and Carver and State of Illinois and Minnesota, respectively, for and in consideration of Ten and no/100--------------------------------- DOLLARS in hand paid, receipt of which is acknowledged, CONVEY and WARRANT to EVERGREEN AVIATION, INC., A DELAWARE CORPORATION, of the City of Taylorville, County of Christian and State of Illinois the following described Real Estate:

Lot 2 and the North Half of Lot 3 of Summer's Subdivision situated in a part of the Southeast Quarter of Section 32, Township 13 North, Range 2 West of the Third Principal Meridian, as shown on the Plat of Subdivision recorded with the Christian County Recorder in Plat Book 5 at page 318.

The grantors herein warrants that the property being conveyed does not constitute Homestead Property of grantors or their spouses.

Together with all easements and appurtenances in favor of said above described property.

Except all coal, minerals and mining rights heretofore conveyed of record.

Subject to taxes for the year 1994 and subsequent years.

Subject to easements, restrictions and reservations of record, if any.

Situated in the City of Taylorville in the County of Christian, in the State of Illinois, hereby releasing and waiving all right under and by virtue of the Homestead Exemption Laws of this State.

Dated this 12 day of April, A.D., 1995.

Mary Henrietta Barnes (SEAL)
MARY HENRIETTA BARNES

Laurie Barnes O'Brien (SEAL)
LAURIE BARNES O'BRIEN

Sharon Leslie Barnes Haasis (SEAL)
SHARON LESLIE BARNES HAASIS

David Bruce Barnes (SEAL)
DAVID BRUCE BARNES

James Michael Barnes (SEAL)
JAMES MICHAEL BARNES

Christopher Cullen Barnes (SEAL)
CHRISTOPHER CULLEN BARNES

STATE OF MINNESOTA)
) SS.
COUNTY OF ~~CARVER~~ Hennepin)

I, Julie A. Early, a Notary Public in and for the County and State aforesaid, DO HEREBY CERTIFY that CHRISTOPHER CULLEN BARNES, A MARRIED PERSON, heir of Ronald D. Barnes, deceased, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act, for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and notarial seal, this 24th day of April, 1995.

Julie A Early (SEAL)
Notary Public

My Commission Expires 1-31-2000

JULIE A. EARLY
NOTARY PUBLIC-MINNESOTA
HENNEPIN COUNTY
My Comm. Expires Jan. 31, 2000

STATE OF ILLINOIS)
) SS.
COUNTY OF SANGAMON)

I, Sandra L. Luzinski, a Notary Public in and for the County and State aforesaid. DO HEREBY CERTIFY that LAURIE LYNN BARNES O'BRIEN, A MARRIED PERSON, SHARON LESLIE BARNES HAASIS, A MARRIED PERSON. DAVID BRUCE BARNES, A SINGLE PERSON AND JAMES MICHAEL BARNES, A DIVORCED PERSON, NOT SINCE REMARRIED, heirs of Ronald D. Barnes, deceased, personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that they signed, sealed and delivered the said instrument as their free and voluntary act, for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and notarial seal, this 12th day of April, 1995.

Sandra L. Luzinski (SEAL)
Notary Public

"OFFICIAL SEAL"
SANDRA L. LUZINSKI
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 7/29/96

My Commission Expires:

STATE OF ILLINOIS)
) SS.
COUNTY OF CHRISTIAN)

I, Jennifer L. Estes, a Notary Public in and for the County and State aforesaid, DO HEREBY CERTIFY that MARY HENRIETTA BARNES, A WIDOW, NOT SINCE REMARRIED, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that she signed, sealed and delivered the said instrument as her free and voluntary act, for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and notarial seal, this 28 day of April, 1995.

Jennifer L. Estes (SEAL)
Notary Public

My Commission Expires 9-25-98

Prepared By:
Presney, Kelly & Presney
726 South Second Street
Springfield, IL 62704 (217) 525-0016

Return To:
Taylorville Title Co.
301 South Webster
P.O. Box 341
Taylorville, IL 62568

"OFFICIAL SEAL"
Jennifer L. Estes
NOTARY PUBLIC
STATE OF ILLINOIS
MY COMMISSION EXPIRES 9-25-98

5562

R000467

1999R 05562

STATE OF ILLINOIS
CHRISTIAN COUNTY } SS No. ____

Filed for record on the 26th day of Aug A.D. 1999
3:30 o'clock P M.

Recorder

WARRANTY DEED

THE GRANTOR, Ruth Summer, also known as Ruth M. Summer, a widow, being the surviving spouse of a deceased husband and not remarried, of University City, Missouri, in consideration of the sum of ten and more dollars and other good and valuable consideration CONVEYS AND WARRANTS to

Evergreen Aviation, Inc., a Delaware Corporation

of having its principal offices in the City of Taylorville, Illinois, the following described real estate:

An undivided one half interest in and to:
The South Half (S 1/2) of Lot 3 and the North Half (N 1/2) of Lot 4 in Summer's Subdivision, a subdivision situated in the SE 1/4 of Section 32, T. 13 N., R. 2 West of the 3rd P. M., as shown by the Plat of subdivision recorded June 14, 1979 in Plat Book 5 page 318, in Christian County, Illinois,

hereby waiving and releasing all rights under and by virtue of the homestead exemption laws of the state of Illinois.
This conveyance is subject to coal and mineral rights heretofore reserved or conveyed way, to easements and restrictions, if any, relating to said premises, and to the general taxes for the years 1998 and 1999, payable in 1999 and 2000, which the grantee assumes and agrees to pay.
This deed is executed and delivered pursuant to and in exercise of the powers and authorities granted in the Power of Attorney dated April 19, 1991, recorded August 12, 1999 as Document No. 1999R5128, which power of attorney is in full force and effect.

Dated this 19 day of August, 1999.

Ruth Summer AKA Ruth M. Summer
by William L. Summer, Her Atty in Fact (SEAL)

Ruth Summer, A/K/A Ruth M. Summer
By William L. Summer, Her Atty in Fact

ste: $7.50 Co: $3.75 Total $11.25

State of California)
) SS
County of San Diego)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that William L. Summer, as the attorney in fact for Ruth Summer, also known as Ruth M. Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as the free and voluntary act and deed of his principal, Ruth Summer, also known as Ruth M. Summer, and as his free and voluntary act as attorney in fact, for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 19 day of August, 1999.

Notary Public

ROBERT L. FEASEL
Commission # 1218686
Notary Public - California
San Diego County
My Comm. Expires May 9, 2003

Prepared by
Hartzell Givens
Taylorville,
Illinois

Send tax statements to:
Evergreen Aviation, Inc.

Taylorville, Illinois

Tax I.D. No. 17-13-32-400-007

5563

R000469

1999R 05563

STATE OF ILLINOIS }
CHRISTIAN COUNTY } SS No. ____
Filed for record on the 26th day
of Aug A.D. 1999
3:30 o'clock P M.

Recorder

WARRANTY DEED

THE GRANTORS, Mark A. Summer, of the City of Taylorville, Illinois, Jay L. Summer, of Bay City, Michigan, Caryn Kay Summer, of the City of Chicago, Illinois, Cathy Ann Summer, of the City of Boulder, Colorado, all of said grantors being married persons, in consideration of the sum of Ten and more Dollars, and other good and valuable consideration CONVEY AND WARRANT to

Evergreen Aviation, Inc., a Delaware Corporation

having its principal offices in the City of Taylorville, Illinois, the following described real estate:
An undivided one half interest in and to:

The South Half (S 1/2) of Lot 3 and the North Half (N 1/2) of Lot 4 in Summer's Subdivision, a subdivision situated in the SE 1/4 of Section 32, T. 13 N., R. 2 West of the 3rd P. M., as shown by the Plat of subdivision recorded June 14, 1979 in Plat Book 5 page 318, in Christian County, Illinois.

This conveyance is subject to coal and mineral rights heretofore reserved or conveyed away, to easements and restrictions, if any, relating to said premises, and to the general taxes for the years 1998 and 1999 payable in 1999 and 2000, which the grantee assumes and agrees to pay.

The grantors, and each of them hereby certify that none of them nor their respective spouses reside on the above premises and no homestead rights are involved in this conveyance.

Dated this 13th day of May, 1999.

Mark A. Summer (SEAL) Mark A. Summer

Jay L. Summer (SEAL) Jay L. Summer

Caryn Kay Summer (SEAL) Caryn Kay Summer

Cathy Ann Summer (SEAL) Cathy Ann Summer

"OFFICIAL SEAL"
Anna D. Griffin
Notary Public, State of Illinois
My Commission Exp. [illegible]

State of Illinois)
) SS
County of Christian)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Mark A. Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 18th day of August, 1999.

"OFFICIAL SEAL"
BRENDA S. SPURLING
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 4/15/00

Brenda S. Spurling
Notary Public

State of Michigan)
) SS
County of Bay)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Jay L. Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 13th day of May, 1999.

Agatha Jankowiak
Notary Public

State of Illinois)
) SS
County of Cook)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Caryn Kay Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that she signed, sealed and delivered the said instrument as her free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 24th day of June, 1999.

Anna D. Griffin
Notary Public

"OFFICIAL SEAL"
Anna D. Griffin
Notary Public, State of Illinois
My Commission Exp. 11/19/2001

State of Illinois)
) SS
County of Christian)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Cathy Ann Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that she signed, sealed and delivered the said instrument as her free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 8 day of July, 1999.

Gretchen Lambrecht
Notary Public

Gretchen Lambrecht
My Commission Expires
June 30, 2001

Prepared by
Hartzell Givens
Taylorville,
Illinois

Send tax statements to:
Evergreen Aviation, Inc.

Taylorville, Illinois

Tax I.D. No.: 17-13-32-400-007-1

State: $7.50 Co: $3.75 Total $11.25

R000472

Christian County Supervisor of Assessments
101 S. Main
Taylorville, IL 62568
(217) 824-5900

Parcel Information

Parcel Number:	17-13-32-400-007-00
Primary Name:	SUMMER MORRIS
Primary Address:	4111 LINCOLN TRL TAYLORVILLE, IL 62568-7718

Property Information

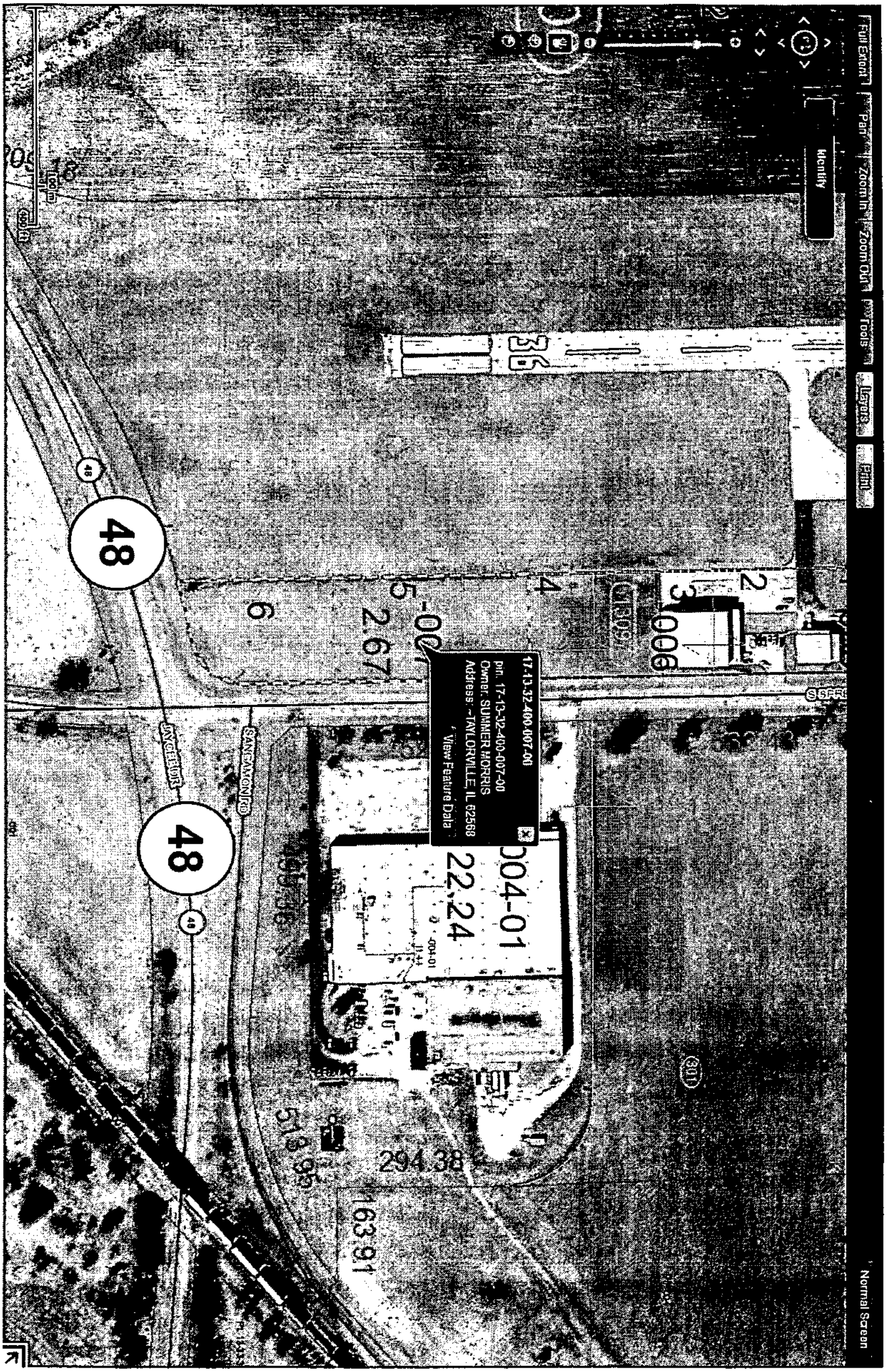
Site Address:	TAYLORVILLE, IL 62568
Tax Code:	540
Section Lot:	32
Legal Township:	13
Range Block:	2W
Subdivision:	SUMMERS SUB
Township Name:	TAYLORVILLE

Assessment Information

Acres:	2.6700
Land:	0
Farm Land:	393
Building:	0
Farm Building:	0
Use Code:	21
Use Description:	

Exemption Information

Owner Occupied:	No
Elderly:	No
Senior Freeze:	No
Improvement:	No
Veterans:	No
Developers:	No
Partial Exemption:	No
Returning Veteran:	No
Disabled Person:	No
Vet 50% Disabled:	No
Vet 75% Disabled:	No
Year Beginning:	No
Year Retired:	No


Full Extent
Pan
Zoom In
Zoom Out
Tools
Layers
Print
Identify
Normal Screen
17-13-32-400-007-00
pin: 17-13-32-400-007-00
Owner: SUMMER MORRIS
Address: --TAYLORVILLE, IL 62568
View Feature Data
004-01
22.24
2.67
294.38
163.91
48
48

5563

1999R R000474 05563

STATE OF ILLINOIS
CHRISTIAN COUNTY } SS No. ____
Filed for record on the 26th day
of Aug A.D. 1999
3:30 o'clock P.M.
Tracy E. Ryan
Recorder

WARRANTY DEED

THE GRANTORS, Mark A. Summer, of the City of Taylorville, Illinois, Jay L. Summer, of Bay City, Michigan, Caryn Kay Summer, of the City of Chicago, Illinois, Cathy Ann Summer, of the City of Boulder, Colorado, all of said grantors being married persons, in consideration of the sum of Ten and more Dollars, and other good and valuable consideration CONVEY AND WARRANT to

Evergreen Aviation, Inc., a Delaware Corporation

having its principal offices in the City of Taylorville, Illinois, the following described real estate:
An undivided one half interest in and to:

The South Half (S 1/2) of Lot 3 and the North Half (N 1/2) of Lot 4 in Summer's Subdivision, a subdivision situated in the SE 1/4 of Section 32, T. 13 N., R. 2 West of the 3rd P. M., as shown by the Plat of subdivision recorded June 14, 1979 in Plat Book 5 page 318, in Christian County, Illinois.

This conveyance is subject to coal and mineral rights heretofore reserved or conveyed away, to easements and restrictions, if any, relating to said premises, and to the general taxes for the years 1998 and 1999 payable in 1999 and 2000, which the grantee assumes and agrees to pay.

The grantors, and each of them hereby certify that none of them nor their respective spouses reside on the above premises and no homestead rights are involved in this conveyance.

Dated this 13th day of May, 1999.

Mark A. Summer (SEAL) — Mark A. Summer

Jay L. Summer (SEAL) — Jay L. Summer

Caryn K Summer (SEAL) — Caryn Kay Summer

Cathy Ann Summer (SEAL) — Cathy Ann Summer

"OFFICIAL SEAL"
Anna D. Griffin
Notary Public, State of Illinois
My Commission Exp. [illegible]

State of California)
) SS
County of San Diego)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that William L. Summer, as the attorney in fact for Ruth Summer, also known as Ruth M. Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as the free and voluntary act and deed of his principal, Ruth Summer, also known as Ruth M. Summer, and as his free and voluntary act as attorney in fact, for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 19 day of August, 1999.

Notary Public

ROBERT L. FEASEL
Commission # 1218686
Notary Public - California
San Diego County
My Comm. Expires May 9, 2003

Prepared by
Hartzell Givens
Taylorville,
Illinois

Send tax statements to:
Evergreen Aviation, Inc.

Taylorville, Illinois

Tax I.D. No. 17-13-32-400-007

State of Illinois)
) SS
County of Christian)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Mark A. Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 18th day of August, 1999.

"OFFICIAL SEAL"
BRENDA S. SPURLING
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 4/15/00

Brenda S. Spurling
Notary Public

State of Michigan)
) SS
County of Bay)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Jay L. Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 13th day of May, 1999.

Agatha Jankowiak
Notary Public

State of Illinois)
) SS
County of Cook)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Caryn Kay Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that she signed, sealed and delivered the said instrument as her free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 24th day of June, 1999.

Anna D. Griffin
Notary Public

"OFFICIAL SEAL"
Anna D. Griffin
Notary Public, State of Illinois
My Commission Exp. 11/19/2001

State of Illinois)
) SS
County of Christian)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Cathy Ann Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that she signed, sealed and delivered the said instrument as her free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 8 day of July, 1999.

Gretchen Lambrecht
Notary Public

Gretchen Lambrecht
My Commission Expires
June 30, 2001

Prepared by
Hartzell Givens
Taylorville,
Illinois

Send tax statements to:
Evergreen Aviation, Inc.

Taylorville, Illinois

Tax I.D. No.: 17-13-32-400-007-1

State: $7.50 Co: $3.75 Total $11.25

5562

R000478

1999R 05562

STATE OF ILLINOIS
CHRISTIAN COUNTY } SS No. ____

Filed for record on the 26th day of Aug A.D. 1999
3:30 o'clock P M.

Recorder

WARRANTY DEED

THE GRANTOR, Ruth Summer, also known as Ruth M. Summer, a widow, being the surviving spouse of a deceased husband and not remarried, of University City, Missouri, in consideration of the sum of ten and more dollars and other good and valuable consideration CONVEYS AND WARRANTS to

Evergreen Aviation, Inc., a Delaware Corporation

of having its principal offices in the City of Taylorville, Illinois, the following described real estate:

> **An undivided one half interest in and to:**
> The South Half (S 1/2) of Lot 3 and the North Half (N 1/2) of Lot 4 in Summer's Subdivision, a subdivision situated in the SE 1/4 of Section 32, T. 13 N., R. 2 West of the 3rd P. M., as shown by the Plat of subdivision recorded June 14, 1979 in Plat Book 5 page 318, in Christian County, Illinois,

hereby waiving and releasing all rights under and by virtue of the homestead exemption laws of the state of Illinois.

This conveyance is subject to coal and mineral rights heretofore reserved or conveyed way, to easements and restrictions, if any, relating to said premises, and to the general taxes for the years 1998 and 1999, payable in 1999 and 2000, which the grantee assumes and agrees to pay.

This deed is executed and delivered pursuant to and in exercise of the powers and authorities granted in the Power of Attorney dated April 19, 1991, recorded August 12, 1999 as Document No. 1999R5128, which power of attorney is in full force and effect.

Dated this 19 day of August, 1999.

Ruth Summer AKA Ruth M. Summer by William L. Summer, Her Atty in Fact

____________________(SEAL)

Ruth Summer, A/K/A Ruth M. Summer
By William L. Summer, Her Atty in Fact

Ste: $7.50 Co: $3.75 Total $11.25

STATE OF ILLINOIS)
) SS.
COUNTY OF CHRISTIAN)

I, Jennifer L. Estes, a Notary Public in and for the County and State aforesaid, DO HEREBY CERTIFY that MARY HENRIETTA BARNES, A WIDOW, NOT SINCE REMARRIED, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that she signed, sealed and delivered the said instrument as her free and voluntary act, for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and notarial seal, this 28 day of April, 1995.

Jennifer L. Estes (SEAL)
Notary Public

My Commission Expires 9-25-98

Prepared By:
Presney, Kelly & Presney
726 South Second Street
Springfield, IL 62704 (217) 525-0016

Return To:
Taylorville Title Co.
301 South Webster
P.O. Box 341
Taylorville, IL 62568

"OFFICIAL SEAL"
Jennifer L. Estes
NOTARY PUBLIC
STATE OF ILLINOIS
MY COMMISSION EXPIRES 9-25-98

R0005562

1999R 05562

STATE OF ILLINOIS }
CHRISTIAN COUNTY } SS No. ____

Filed for record on the 26th day of Aug A.D. 1999
3:30 o'clock P M.

Barry E. Ryan
Recorder

WARRANTY DEED

THE GRANTOR, Ruth Summer, also known as Ruth M. Summer, a widow, being the surviving spouse of a deceased husband and not remarried, of University City, Missouri, in consideration of the sum of ten and more dollars and other good and valuable consideration CONVEYS AND WARRANTS to

Evergreen Aviation, Inc., a Delaware Corporation

of having its principal offices in the City of Taylorville, Illinois, the following described real estate:

An undivided one half interest in and to:
The South Half (S 1/2) of Lot 3 and the North Half (N 1/2) of Lot 4 in Summer's Subdivision, a subdivision situated in the SE 1/4 of Section 32, T. 13 N., R. 2 West of the 3rd P. M., as shown by the Plat of subdivision recorded June 14, 1979 in Plat Book 5 page 318, in Christian County, Illinois,

hereby waiving and releasing all rights under and by virtue of the homestead exemption laws of the state of Illinois.
This conveyance is subject to coal and mineral rights heretofore reserved or conveyed way, to easements and restrictions, if any, relating to said premises, and to the general taxes for the years 1998 and 1999, payable in 1999 and 2000, which the grantee assumes and agrees to pay.
This deed is executed and delivered pursuant to and in exercise of the powers and authorities granted in the Power of Attorney dated April 19, 1991, recorded August 12, 1999 as Document No. 1999R5128, which power of attorney is in full force and effect.

Dated this 19 day of August, 1999.

Ruth Summer AKA Ruth M. Summer
by William L. Summer, Her Atty in Fact
_________________________(SEAL)
Ruth Summer, A/K/A Ruth M. Summer
By William L. Summer, Her Atty in Fact

State: $7.50 Co: $3.75 Total $11.25

State of California)
) SS
County of San Diego)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that William L. Summer, as the attorney in fact for Ruth Summer, also known as Ruth M. Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as the free and voluntary act and deed of his principal, Ruth Summer, also known as Ruth M. Summer, and as his free and voluntary act as attorney in fact, for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 19 day of August, 1999.

Notary Public

ROBERT L. FEASEL
Commission # 1218686
Notary Public - California
San Diego County
My Comm. Expires May 9, 2003

Prepared by
Hartzell Givens
Taylorville,
Illinois

Send tax statements to:
Evergreen Aviation, Inc.

Taylorville, Illinois

Tax I.D. No. 17-13-32-400-007

R000482 5563

1999R 05563

STATE OF ILLINOIS } SS No. ____
CHRISTIAN COUNTY }
Filed for record on the 26th day of Aug A.D. 1999
3:30 o'clock P.M.

Recorder

WARRANTY DEED

THE GRANTORS, Mark A. Summer, of the City of Taylorville, Illinois, Jay L. Summer, of Bay City, Michigan, Caryn Kay Summer, of the City of Chicago, Illinois, Cathy Ann Summer, of the City of Boulder, Colorado, all of said grantors being married persons, in consideration of the sum of Ten and more Dollars, and other good and valuable consideration CONVEY AND WARRANT to

Evergreen Aviation, Inc., a Delaware Corporation

having its principal offices in the City of Taylorville, Illinois, the following described real estate:
An undivided one half interest in and to:

The South Half (S 1/2) of Lot 3 and the North Half (N 1/2) of Lot 4 in Summer's Subdivision, a subdivision situated in the SE 1/4 of Section 32, T. 13 N., R. 2 West of the 3rd P. M., as shown by the Plat of subdivision recorded June 14, 1979 in Plat Book 5 page 318, in Christian County, Illinois.

This conveyance is subject to coal and mineral rights heretofore reserved or conveyed away, to easements and restrictions, if any, relating to said premises, and to the general taxes for the years 1998 and 1999 payable in 1999 and 2000, which the grantee assumes and agrees to pay.

The grantors, and each of them hereby certify that none of them nor their respective spouses reside on the above premises and no homestead rights are involved in this conveyance.

Dated this 13th day of May, 1999.

Mark A. Summer (SEAL) Jay L. Summer (SEAL)
Mark A. Summer Jay L. Summer

Caryn Kay Summer (SEAL) Cathy Ann Summer (SEAL)
Caryn Kay Summer Cathy Ann Summer

"OFFICIAL SEAL"
Anna D. Griffin
Notary Public, State of Illinois
My Commission Exp. [illegible]

State of Illinois)
) SS
County of Christian)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Mark A. Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 18th day of August, 1999.

"OFFICIAL SEAL"
BRENDA S. SPURLING
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 4/15/03

Brenda S. Spurling
Notary Public

State of Michigan)
) SS
County of Bay)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Jay L. Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 13th day of May, 1999.

Agatha Jankowiak
Notary Public

State of Illinois)
) SS
County of Cook)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Caryn Kay Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that she signed, sealed and delivered the said instrument as her free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 24th day of June, 1999.

Anna D. Griffin
Notary Public

"OFFICIAL SEAL"
Anna D. Griffin
Notary Public, State of Illinois
My Commission Exp. 11/19/2001

State of Illinois)
) SS
County of Christian)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that Cathy Ann Summer, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that she signed, sealed and delivered the said instrument as her free and voluntary act and deed for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 8 day of July, 1999.

Gretchen Lambrecht
Notary Public

Gretchen Lambrecht
My Commission Expires
June 30, 2001

Prepared by
Hartzell Givens
Taylorville,
Illinois

Send tax statements to:
Evergreen Aviation, Inc.

Taylorville, Illinois

Tax I.D. No.: 17-13-32-400-007-1

State: $7.50 Co: $3.75 Total $11.25

ATTACHMENT P

LPC # 0210600007– Christian County
Taylorville/The Paint Shop
USEPA #ILD982621690
FOS FILE

and

LPC # 0210605081– Christian County
Taylorville/Evergreen Aviation
FOS FILE

The attached corporate records are for Brandis Aircraft, LLC and Evergreen Aviation, Inc., including this cover page for a total of 5 pages.

R000486

Department of State: Division of Corporations

Entity Details

THIS IS NOT A STATEMENT OF GOOD STANDING

File Number:	**2493943**	Incorporation Date / Formation Date:	**03/28/1995** (mm/dd/yyyy)
Entity Name:	**EVERGREEN AVIATION INC.**		
Entity Kind:	**CORPORATION**	Entity Type:	**GENERAL**
Residency:	**DOMESTIC**	State:	**DE**

REGISTERED AGENT INFORMATION

Name:	**CORPAMERICA, INC.**		
Address:	**2711 CENTERVILLE ROAD, SUITE 400**		
City:	**WILMINGTON**	County:	**NEW CASTLE**
State:	**DE**	Postal Code:	**19808**
Phone:	**(302)636-5440**		

Additional Information is available for a fee. You can retrieve Status for a fee of $10.00 or more detailed information including current franchise tax assessment, current filing history and more for a fee of $20.00.

Would you like ○ Status ○ Status,Tax & History Information [Submit]

[Back to Entity Search]

To contact a Delaware Online Agent click here.

Department of State: Division of Corporations

Entity Details

THIS IS NOT A STATEMENT OF GOOD STANDING

File Number:	**5540803**	Incorporation Date / Formation Date:	**05/28/2014** (mm/dd/yyyy)
Entity Name:	**BRANDIS AIRCRAFT, LLC**		
Entity Kind:	**LIMITED LIABILITY COMPANY (LLC)**	Entity Type:	**GENERAL**
Residency:	**DOMESTIC**	State:	**DE**

REGISTERED AGENT INFORMATION

Name:	**CORPORATION SERVICE COMPANY**		
Address:	**2711 CENTERVILLE RD SUITE 400**		
City:	**WILMINGTON**	County:	**NEW CASTLE**
State:	**DE**	Postal Code:	**19808**
Phone:	**(302)636-5401**		

Additional Information is available for a fee. You can retrieve Status for a fee of $10.00 or more detailed information including current franchise tax assessment, current filing history and more for a fee of $20.00.

Would you like ☐ Status ☐ Status,Tax & History Information Submit

Back to Entity Search

To contact a Delaware Online Agent click here.

R000488

LLC FILE DETAIL REPORT

Entity Name	BRANDIS AIRCRAFT, LLC	File Number	04786815
Status	ACTIVE	On	06/12/2014
Entity Type	LLC	Type of LLC	Foreign
File Date	06/12/2014	Jurisdiction	DE
Agent Name	ILLINOIS CORPORATION SERVICE C	Agent Change Date	06/12/2014
Agent Street Address	801 ADLAI STEVENSON DRIVE	Principal Office	2301 S SPRESSER STREET TAYLORVILLE, IL 625680000
Agent City	SPRINGFIELD	Management Type	MBR View
Agent Zip	62703	Duration	PERPETUAL
Annual Report Filing Date	00/00/0000	For Year	
Series Name	NOT AUTHORIZED TO ESTABLISH SERIES		

Return to the Search Screen

Purchase Certificate of Good Standing
(One Certificate per Transaction)

BACK TO CYBERDRIVEILLINOIS.COM HOME PAGE

R000489

WWW.CYBERDRIVEILLINOIS.COM

JESSE WHITE
SECRETARY OF STATE

LLC MEMBERS

Entity Name	BRANDIS AIRCRAFT, LLC	File Number	04786815

Name	Address
BRANDIS, MICHAEL J	2301 S SPRESSER STREET, TAYLORVILLE, IL - 62568
BRANDIS, ROBERT J	2301 S SPRESSER STREET, YTAYLORVILLE, IL - 62568

Close

BACK TO CYBERDRIVEILLINOIS.COM HOME PAGE

LPC # 0210600007– Christian County
Taylorville/The Paint Shop
USEPA #ILD982621690
FOS FILE

LPC # 0210605081– Christian County
Taylorville/Evergreen Aviation
FOS FILE

R000490
ATTACHMENT Q

United States
Environmental Protection
Agency

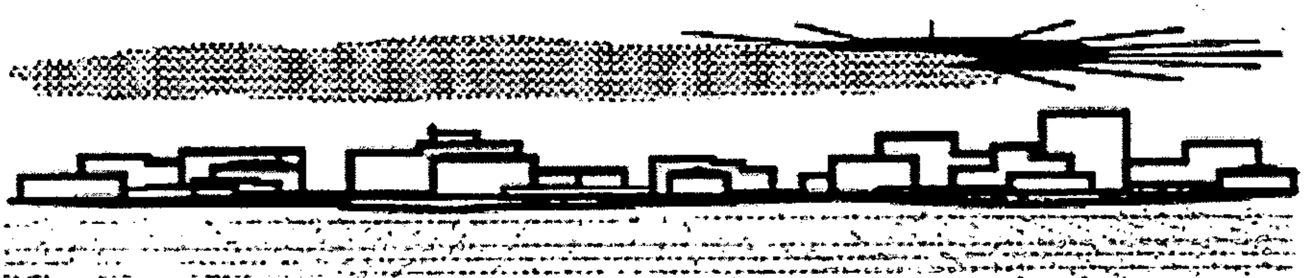
Office of Air Quality
Planning and Standards
Research Triangle Park, NC 27711

EPA-454/R-93-005
February 1993

Air

EPA

LOCATING AND ESTIMATING AIR EMISSIONS FROM SOURCES OF METHYLENE CHLORIDE



L & E

LOCATING AND ESTIMATING AIR EMISSIONS FROM SOURCES OF METHYLENE CHLORIDE

Final Report

Prepared for:

Dallas Safriet
Emission Inventory Branch
U. S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

Prepared by:

Radian Corporation
Post Office Box 13000
Research Triangle Park, North Carolina 27709

April 22, 1993

EPA-454/R-93-006

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APPENDICES

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SECTION 1
PURPOSE OF DOCUMENT

The Environmental Protection Agency (EPA) and State and local air pollution control agencies are becoming increasingly aware of the presence of substances in the ambient air that may be toxic at certain concentrations. This awareness has led to attempts to identify source/receptor relationships and to develop control programs to regulate toxic emissions. Unfortunately, very little information is available on the ambient air concentrations of these substances or on the sources that may be discharging them to the atmosphere.

To assist groups interested in inventorying air emissions of various potentially toxic substances, EPA is preparing a series of documents, such as this one, that compiles available information on sources and emissions. Existing documents in the series are listed below.

Substance	EPA Publication Number
Acrylonitrile	EPA-450/4-84-007a
Carbon Tetrachloride	EPA-450/4-84-007b
Chloroform	EPA-450/4-84-007c
Ethylene Dichloride	EPA-450/4-84-007d
Formaldehyde (Revised)	EPA-450/2-91-012
Nickel	EPA-450/4-84-007f
Chromium	EPA-450/4-84-007g
Manganese	EPA-450/4-84-007h
Phosgene	EPA-450/4-84-007i
Epichlorohydrin	EPA-450/4-84-007j
Vinylidene Chloride	EPA-450/4-84-007k
Ethylene Oxide	EPA-450/4-84-007l
Chlorobenzenes	EPA-450/4-84-007m
Polychlorinated Biphenyls (PCBs)	EPA-450/4-84-007n
Polycyclic Organic Matter (POM)	EPA-450/4-84-007p
Benzene	EPA-450/4-84-007q
Organic Liquid Storage Tanks	EPA-450/4-88-004
Coal and Oil Combustion Sources	EPA-450/2-89-001
Municipal Waste Combustors	EPA-450/2-89-006
Perchloroethylene and	EPA-450/2-90-013
1,3-Butadiene	EPA-450/2-89-021
Chromium (supplement)	EPA-450/2-89-002
Sewage Sludge	EPA-450/2-90-009
Styrene	EPA-450/4-91-029

This document deals specifically with methylene chloride (MC), also known as dichloromethane. The intended audience includes Federal, State and local air pollution personnel and others who are interested in locating potential emitters of MC and in making gross estimates of MC air emissions.

Data on some potential sources of MC emissions are limited and the configurations of many sources will differ from those described here. Therefore, this document is best used as a primer to inform air pollution personnel about (1) the types of sources that may emit MC, (2) process variations and release points that may be expected within these sources, and (3) available emissions information indicating the potential for MC to be released into the air from each operation.

The reader is strongly cautioned against using the emissions information contained in this document to develop an exact assessment of emissions from any particular facility. Because insufficient data are available to develop statistical estimates of the accuracy of these emission factors, no estimate can be made of the error that could result when these factors are used to calculate emissions from any given facility. It is possible, in some extreme cases, that order-of-magnitude differences could result between actual and calculated emissions, depending on differences in source configurations, control equipment, and operating practices. Thus, in situations where an accurate assessment of MC emissions is necessary, source-specific information should be obtained to confirm the existence of particular emitting operations, the types and effectiveness of control measures, and the impact of operating practices.

In addition to the information presented in this document, another potential source of MC emissions data is the Toxic Chemical Release Inventory (TRI) form required by Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA 313.)[1] SARA 313 requires owners and operators of certain facilities that manufacture, import, process, or otherwise use certain toxic chemicals to annually report releases to any environmental media. As part of SARA 313, EPA provides public access to the annual emissions data. The TRI data include general facility information, chemical information, and emissions data. Air emissions data are reported as total facility release estimates, broken out into fugitive and point components. No individual process or stack data are provided to EPA. The TRI requires the use of available stack monitoring or measurement of emissions to comply with SARA 313. If monitoring data are unavailable, emissions are to be quantified based on best estimates of releases to the environment.

The reader is cautioned that the TRI will not likely provide facility, emissions, and chemical release data sufficient for conducting detailed exposure modeling and risk assessment. In many cases, the TRI data are based on annual estimates of emissions (i.e., on emission factors, material balances, engineering judgement). In addition, for 1989 and subsequent years, only those facilities manufacturing or processing in excess of 25,000 lbs/yr (11,340 kg/yr) of MC, or otherwise using in excess of 10,000 lbs/yr (4,540 kg/yr) of MC, were required to report MC emissions.[2] Thus, facilities that emit MC but fall below these thresholds may not be included in the TRI database.

The reader is urged to obtain TRI data in addition to the information provided in this document to locate potential emitters of MC and to make preliminary estimates of air emissions from these facilities. To obtain an exact assessment of air emissions from processes at a specific facility, source tests or detailed material balance calculations should be conducted, and detailed plant site information should be compiled.

REFERENCES FOR SECTION 1

1. Toxic Chemical Release Reporting: Community Right-To-Know, 52 FR 21152-21208, June 4, 1987.

2. Toxic Chemical Release Inventory Reporting Package for 1990, EPA 560/4-91-001, U.S. Environmental Protection Agency, January 1991, p. 9.

SECTION 2
OVERVIEW OF DOCUMENT CONTENTS

This section outlines the nature, extent, and format of the material presented in the remaining sections of this report.

Section 3 briefly summarizes the physical and chemical characteristics of MC, and provides an overview of its production and use. This background section may be useful in developing a general perspective on the nature of MC and how it is manufactured and consumed.

Sections 4 and 5 focus on major source categories that may discharge MC air emissions. Section 4 discusses emissions from the production of MC; Section 5 discusses emissions from the major uses of MC.

Example process descriptions and flow diagrams, potential emission points, and available emission factor estimates that show the potential for MC emissions before and after controls are presented for each major industrial source category described in Section 4 and 5. Also included are the names of individual companies that either produce or use MC, based primarily on information from trade publications.

Section 6 summarizes available procedures for source sampling and analysis of MC. Details are not prescribed nor is any EPA endorsement given or implied to any of these procedures. At this time, EPA has not generally evaluated these methods. Consequently, this document merely provides an overview of applicable source sampling procedures, citing references for those interested in conducting source tests.

This document does not contain any discussion of health or other environmental effects of MC, nor does it include any discussion of ambient air levels or ambient air monitoring techniques.

Comments on the contents or usefulness of this document are welcome, as is any information on process descriptions, operating practices, control measures, and emissions that would enable EPA to improve its contents. All comments should be sent to:

Chief, Emission Factor and Methodologies Section
Emission Inventory Branch (MD-14)
U. S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

SECTION 3

BACKGROUND

NATURE OF POLLUTANT

Methylene chloride (Chemical Abstracts Registry Number 75-09-2), a saturated aliphatic halogenated hydrocarbon, is a clear, colorless, volatile liquid with an odor similar to ether. Methylene chloride is a chemical used in many applications because of its high solvency, low corrosiveness to many metals, and lack of flash or fire point.[1] It was introduced as a replacement for more flammable solvents over 60 years ago because of its extensive oil and fat solubility, and low flammability potential.

Methylene chloride's molecular structure is represented as:

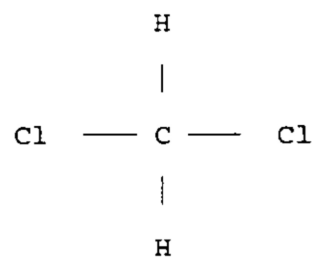

Table 1 shows the chemical and physical properties of MC.[2-4]

Methylene chloride is released to the atmosphere during its production and use. The EPA has indicated that MC may be exempted from regulation as a volatile organic compound (VOC) under state regulations implementing the national ambient air quality standard for ozone because it is not considered to appreciably contribute to ozone formation; however, MC is on the list of 189 hazardous air pollutants (HAP's) to be regulated under Section 112 of the Clean Air Act (Title III). Methylene chloride waste solvent is considered a hazardous waste under the Resource Conservation and Recovery Act (RCRA) because it poses a human health threat as a probable human carcinogen and neurotoxin. The reportable quantity for releases (any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, excluding those releases that result in exposure to persons solely in the workplace and emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel or pipeline pumping station) under the Comprehensive Environmental Response,

TABLE 1. CHEMICAL AND PHYSICAL PROPERTIES OF METHYLENE CHLORIDE

Synonyms	Dichloromethane (DCM), methylene dichloride, methylene bichloride, methane dichloride	
Chemical Abstracts Registry Number		75-09-2
Molecular formula		CH_2Cl_2
Molecular weight		84.9
Ambient state	Clear, colorless, volatile liquid	
Odor threshold	Between 100 and 300 ppm ethereal odor	
Boiling point at 101.3 kPa (760mmHg)		39.8°C
Freezing point		-96.7°C
Density, at 20°C kg/m^3		1315.7
Specific gravity, at 20°C		1.320
Vapor density (air = 1.02)		2.93
Vapor Pressure:		
kPa at 0°C		19.6
kPa at 20°C		46.5
kPa at 30°C		68.1
Diffusivity in air, m^2/s		9×10^{-5}
Refractive index at 20°C		1.4244
Coefficient of cubical expansion (20-35°C)		.0014
Viscosity at 20°C mPa x s (=cP)		.43
Surface tension:		
N/m (=dyn/cm) at 20°C		.02812
Heat of combustion, MJ/kg		7.1175
Heat of vaporization:		
at 20°C, KJ/kg (Btu/lb)		329.23 (141.7)
at 20°C, Kcal/kg		78.69
Heat capacity:		
at 25° C, J/mol		54.09
at 25°C, cal, mol		12.93
Solubility	Soluble with other grades of chlorinated solvents, diethyl ether, ethanol, ethyl alcohol, phenols, aldehydes, ketones, glacial acetic acid, triethyl phosphate, acetoacetic ester, and water (13.2 g/kg at 20°C).	
Flash point (ASTM) D1310-67	None, however, as little as 10 vol% acetone or methyl alcohol can produce one.	
Flammable (explosive) limits		
at 25°C, vol% in air		14-25
Auto-ignition temperature		640°C
Electrical properties at 24°		
Dielectric strength, V/cm (V/100 mils)		94.488 (24.00)
Specific resistivity at 24°, Ω · cm		1.81×10^8
Dielectric constant at 24°C, 100kHz		10.7

Source: References 2, 3, and 4.

Compensation, and Liability Act (CERCLA, or Superfund), is 1,000 pounds (454 kg).

In 1989, the Food and Drug Administration banned the use of MC in cosmetic products. Since 1990, the Consumer Product Safety Commission has required manufacturers, importers, packagers, and private labelers of consumer products containing 1 percent or more MC to report such information on product labels and in product marketing.

In November 1991, the Occupational Safety and Health Administration published a proposal to amend its existing regulation for employee exposure to MC.[5] The proposed standard, which would impact a number of industries, lowers the permissible exposure limit from 500 ppm MC to 25 ppm.

OVERVIEW OF PRODUCTION AND USE

Methylene chloride is produced in the United States by three companies at five plants with an estimated combined production capacity of 250 Mg (551 million pounds).[6] Total 1991 production of MC was 182 Mg (400 million pounds), of which an estimated 33 percent (60 Mg or 132 million pounds) was exported.[6] In 1991, use of MC in the United States was approximately 126 Mg (277 million pounds) of which 2 percent (3 Mg, or 7 million pounds) was imported.[6]

Methylene chloride demand in the United States has declined steadily in recent years with an estimated 15 percent decline in 1991.[6] This decline can be attributed to solvent recycling, environmental and occupational health concerns, and a slow economy.

Methylene chloride end uses include:

- as an active ingredient in solvent-based nonflammable paint removers/strippers;
- in the manufacture of polycarbonate resins;
- in the production of cellulose triacetate;
- as an auxiliary foam blowing and mold-releasing agent;
- as a carrier for pharmaceutical tablet coatings;

- as a solvent in vapor and nonvapor metal cleaning processes;
- as a solvent in aerosols;
- for photoresist stripping in electronic circuit board manufacture;
- as an inert ingredient in pesticides; and
- as an extractant in the recovery of oleoresins, oils, fats, and waxes.[6,7]

Table 2 shows the estimated U.S. consumption by end use for 1991.[6] Methylene chloride end use processes are discussed in detail in Section 5.

Table 3 lists potential source categories of MC emissions by their two-digit Standard Industrial Classification (SIC) code.[8] These source categories presented by SIC code represent MC use by a particular industry. The processes using MC within these industries are not reported in the TRI data used to generate Table 3. For example, within the Chemicals and Allied Products SIC code (which includes production of MC and other chemicals, plastics, pharmaceuticals, pesticides, and other products), MC may be used as an ingredient in the product or as a solvent, paint remover, or metal cleaner elsewhere in the plant.

TABLE 2. ESTIMATED UNITED STATES METHYLENE CHLORIDE CONSUMPTION BY END USE FOR 1991
[in Mg (Million Pounds)]

Paint Removal/Stripper	39,100 (86)
Plastics (polycarbonate resins, triacetate fiber)	20,000 (44)
Flexible Polyurethane Foam	17,700 (39)
Pharmaceuticals	13,600 (30)
Metal Cleaning/Degreasing	13,600 (30)
Aerosols	10,000 (32)
Electronics	5,000 (11)
Miscellaneous (pesticides, food processing, and synthetic fibers)	6,400 (14)
Total	125,400 (276)

Source: Reference 6.

TABLE 3. POTENTIAL SOURCE CATEGORIES OF METHYLENE CHLORIDE EMISSIONS

SIC[a] Code	Source Description	Number of Plants Reporting the Use of MC
28	Chemicals and Allied Products	653
30	Rubber and Miscellaneous Plastics Products	278
37	Transportation Equipment	164
34	Fabricated Metal Products	139
36	Electric & Other Electronic Equipment	137
35	Industrial Machinery and Equipment	85
33	Primary Metal Industries	68
32	Stone, Clay, and Glass Products	53
38	Instruments and Related Products	49
39	Miscellaneous Manufacturing Industries	42
25	Furniture and Fixtures	28
22	Textile Mill Products	25
26	Paper and Allied Products	19
27	Printing and Publishing	16
51	Wholesale Trade Nondurable Goods	15
31	Leather and Leather Products	12
29	Petroleum and Coal Products	11
20	Food and Kindred Products	11
23	Apparel and Other Textile Products	9
24	Lumber and Wood Products	9
73	Business Services	3
00	Blank	3
50	Wholesale Trade Durable Goods	2
49	Electric, Gas, and Sanitary Services	2
97	National Security and Intl. Affairs	2
87	Engineering & Management Services	2
46	Pipelines, except Natural Gas	1
08	Forestry	1
75	Auto Repair, Services, and Parking	1
02	Agricultural Production Livestock	1
96	Administration of Economic Programs	1
47	Transportation Services	1
42	Trucking and Warehousing	1
45	Transportation by Air	1
	TOTAL	1,845

Source: Reference 8.

[a] SIC = Standard Industrial Classification

REFERENCES FOR SECTION 3

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2. "IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans," International Agency for Research on Cancer, World Health Organization, Lyon, France, October 1979, pp. 449-450.

3. T. Anthony, "Methylene Chloride, Chlorocarbons and Chlorohydrocarbons (CH_2Cl_2)," Encyclopedia of Chemical Technology, Third Edition, John Wiley & Sons, Inc, New York, 1983, p. 687.

4. T. Anthony, "Methylene Chloride, Chlorocarbons and Chlorohydrocarbons," Concise Encyclopedia of Chemical Technology, John Wiley & Sons, Inc, New York, 1985, p. 262.

5. Occupational Safety and Health Administration Proposal for New Methylene Chloride Standard, 56 FR 57036, November 7, 1991.

6. "Chemical Profile--Methylene Chloride," Chemical Marketing Reporter, 241(9):42, March 2, 1992.

7. White Paper -- Methylene Chloride, Halogenated Solvents Industry Alliance, Washington, DC, February 1989.

8. Memorandum and attached computer file from E. Cotter, SYCOM, Washington, DC, to C. Thornton, U.S. Environmental Protection Agency, Research Triangle Park, NC, April 22, 1992.

SECTION 4
EMISSIONS FROM METHYLENE CHLORIDE PRODUCTION

As noted in Section 3, MC is produced in the United States by three companies at five plants. These plants, and associated locations, are presented in Table 4.[1] Figure 1 illustrates plant locations. Dow and Occidental Chemical both report methanol for use as a raw material in their production of MC, and Vulcan Materials Company reports 33 percent methane and 67 percent methanol for use as a raw material in their production of MC.[2]

Methylene chloride is generally stored in outdoor tanks and is distributed in bulk quantities by tank truck, railcar, barge, or 55-gallon drums. Production equipment includes storage tanks, reactor vessels, distillation columns, scrubbers, drying towers, pumps, valves, conduits, and piping.

PROCESS DESCRIPTIONS

In the United States, MC is produced by two processes: (1) direct chlorination of methane to produce methyl chloride, and (2) hydrochlorination of methanol to produce methyl chloride. Methyl chloride produced by both of these processes is chlorinated further by chlorine to produce methylene chloride. The predominant production process in the United States is the hydrochlorination of methanol.[3]

Methylene chloride production, regardless of the process method employed, is a continuous production process that takes place in an enclosed system.[4] Both MC production processes are described in the following paragraphs.

Direct Chlorination of Methane

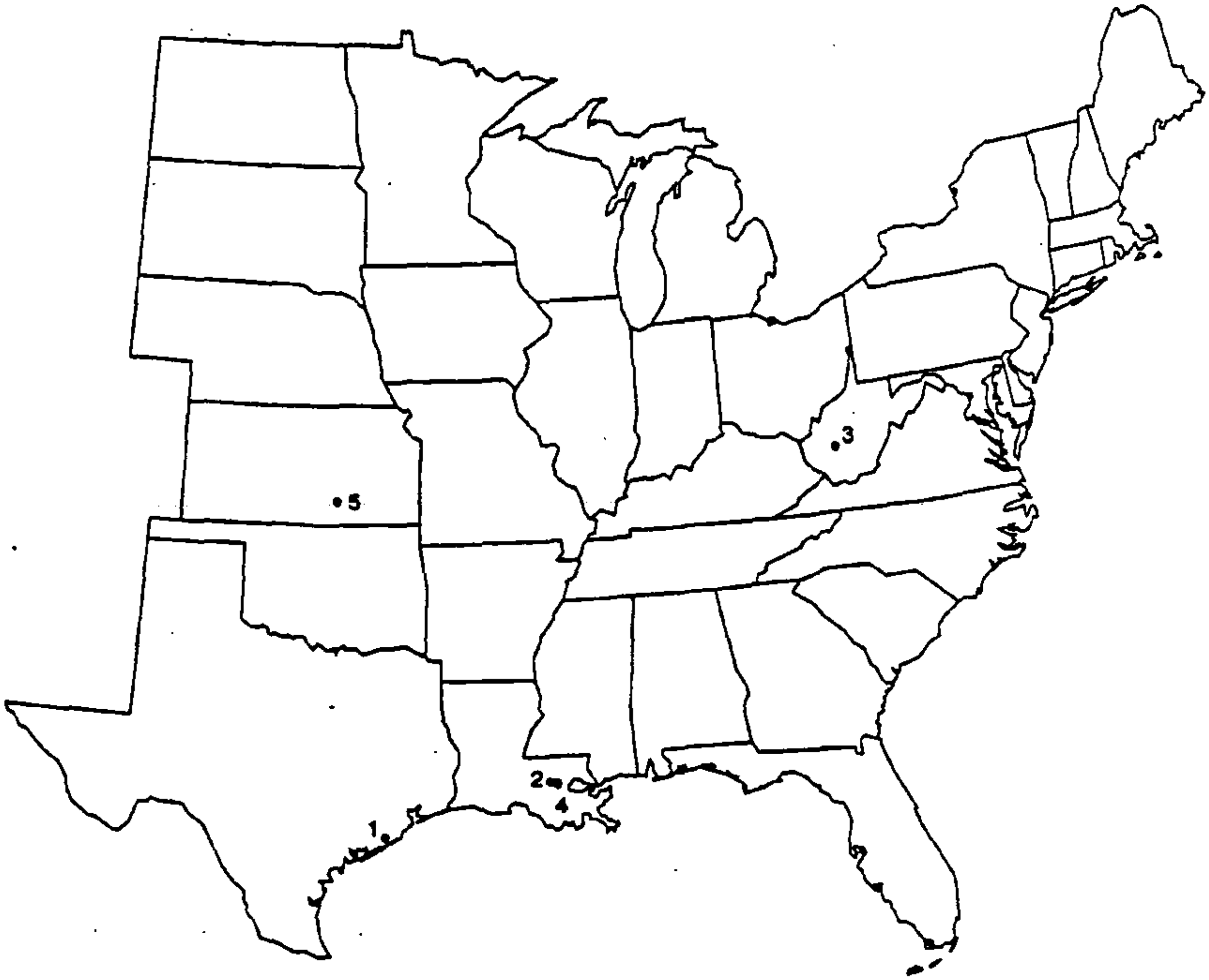
The direct chlorination of methane yields MC by the direct reaction of excess methane (natural gas) with chlorine at a high temperature (340-370°C) and at a pressure slightly above one atmosphere, producing methyl chloride, MC, chloroform, and carbon tetrachloride as coproducts.[3,4]

TABLE 4. UNITED STATES METHYLENE CHLORIDE PRODUCTION

Producer	Location	Production Process
Dow Chemical U.S.A.	Freeport, Texas	Hydrochlorination of Methanol
Dow Chemical U.S.A.	Plaquemine, Louisiana	Hydrochlorination of Methanol
Occidental Petroleum Corporation	Belle, West Virginia	Hydrochlorination of Methanol
Vulcan Materials Company	Geismar, Louisiana	Hydrochlorination of Methanol
Vulcan Material Company	Wichita, Kansas	Hydrochlorination of Methanol and Chlorination of Methane

Note: LCP Chemicals closed a_27 Mg (60 million-pound) production capacity plant in Moundsville, West Virginia, in August 1991.[1]

Source: References 1, 2 and 3.



LEGEND OF PLANT NAMES AND LOCATIONS
1. Dow Chemical U.S.A., Freeport, TX
2. Dow Chemical U.S.A., Plaquemine, LA
3. Occidental Petroleum Corporation, Belle, WV
4. Vulcan Materials Company, Geismar, LA
5. Vulcan Materials Company, Wichita, KA

Sources: References 1 and 2

Figure 1. Locations of plants manufacturing Methylene Chloride.

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The process entails mixing methane with chlorine and then feeding the mixture to a chlorination reactor where MC, methyl chloride, chloroform, and carbon tetrachloride are formed. The co-products are separated by distillation and methyl chloride is recycled back to the chlorination reactor, where it can be controlled to yield mostly MC. This chlorination process is illustrated by the following reactions.[3,5]

$$\underset{\text{(methane)}}{CH_4} + \underset{\text{(chlorine)}}{Cl_2} \dashrightarrow \underset{\text{(methyl chloride)}}{CH_3Cl} + \underset{\text{(hydrogen chloride)}}{HCl}$$

$$\underset{\text{(methyl chloride)}}{CH_3Cl} + \underset{\text{(chlorine)}}{Cl_2} \dashrightarrow \underset{\text{(methylene chloride)}}{CH_2Cl_2} + \underset{\text{(hydrogen chloride)}}{HCl}$$

$$\underset{\text{(methylene chloride)}}{CH_2Cl_2} + \underset{\text{(chlorine)}}{Cl_2} \dashrightarrow \underset{\text{(chloroform)}}{CHCl_3} + \underset{\text{(hydrogen chloride)}}{HCl}$$

$$\underset{\text{(chloroform)}}{CHCl_3} + \underset{\text{(chlorine)}}{Cl_2} \dashrightarrow \underset{\text{(carbon tetrachloride)}}{CCl_4} + \underset{\text{(hydrogen chloride)}}{HCl}$$

A process flow diagram illustrating the direct chlorination of methane to produce MC is presented in Figure 2.[3]

<u>Hydrochlorination of Methanol</u>

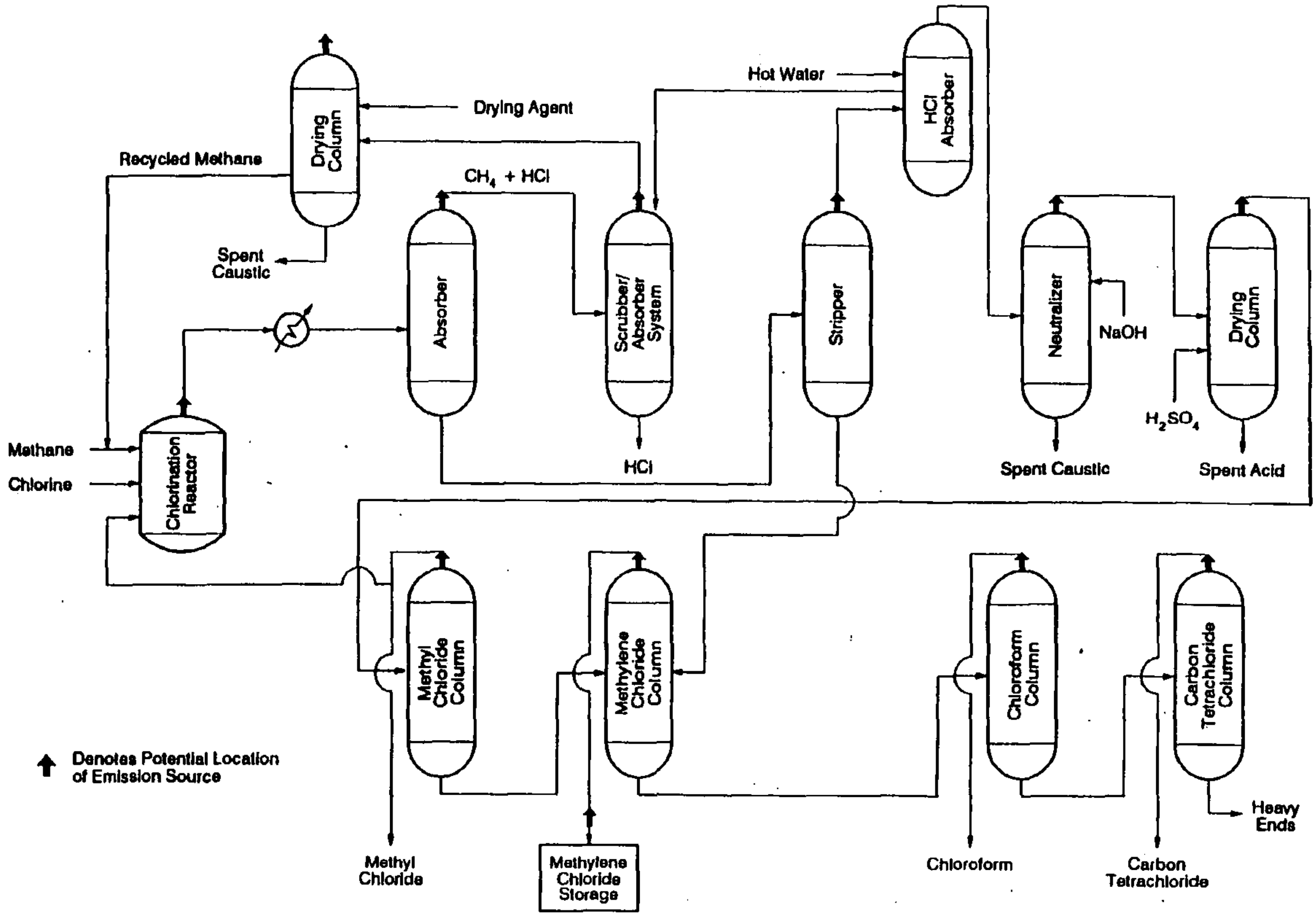
Hydrochlorination of methanol involves the vapor-phase reaction of hydrogen chloride and methanol with the addition of a catalyst at 180-200°C to the hydrochlorination reactor, (maintained at 350°C) which yields methyl chloride.[5] The exit gases from the reactor pass through a quench tower, scrubber, and drying tower prior to yielding methyl chloride.[5] Methyl chloride then undergoes further chlorination, stripping, and distillation to yield MC and chloroform. These chlorination processes are illustrated by the following reactions.[3,5]

$$\underset{\text{(methanol)}}{CH_3OH} + \underset{\text{(hydrogen chloride)}}{HCl} \xrightarrow[\text{vapor-phase}]{\text{catalyst}} \underset{\text{(methyl chloride)}}{CH_3C} + \underset{\text{(water)}}{H_2O}$$

$$\underset{\text{(methyl chloride)}}{CH_3Cl} + \underset{\text{(chlorine)}}{Cl_2} \dashrightarrow \underset{\text{(methylene chloride)}}{CH_2Cl_2} + \underset{\text{(hydrogen chloride)}}{HCl}$$

$$\underset{\text{(methylene chloride)}}{CH_2Cl_2} + \underset{\text{(chlorine)}}{Cl_2} \dashrightarrow \underset{\text{(chloroform)}}{CHCl_3} + \underset{\text{(hydrogen chloride)}}{HCl}$$

$$\underset{\text{(chloroform)}}{CHCl_3} + \underset{\text{(chlorine)}}{Cl_2} \dashrightarrow \underset{\text{(carbon tetrachloride)}}{CCl_4} + \underset{\text{(hydrogen chloride)}}{HCl}$$



Source: Reference 3

Figure 2. Process flow diagram for the production of Methylene Chloride and co-products by the direct chlorination of methane.

Catalysts that are often employed in this process include cuprous chloride, activated charcoal, and zinc chloride.[3] The hydrochlorination of methanol process to produce MC is illustrated in Figure 3.

EMISSION SOURCES AND CONTROLS

In 1985, producers of MC, in response to Section 114 questionnaires, provided estimates and sources of emissions from their 1983 MC production process. The largest sources of emissions reported by all six plants operating at the time were equipment leaks, storage tanks, and transfer emissions (i.e., loading MC into railroad tanks and truck tanks, and drum filling). Other sources reported by all six plants included process vents, equipment openings, relief devices, and secondary emissions (e.g., wastewater treatment). Because production equipment components, including storage tanks and loading facilities, are often located outdoors, MC solvent losses due to leaks (i.e., from gaskets, pipe couplings, pumps, valves, and in-line sampling ports) are often dispersed directly to the atmosphere.[4]

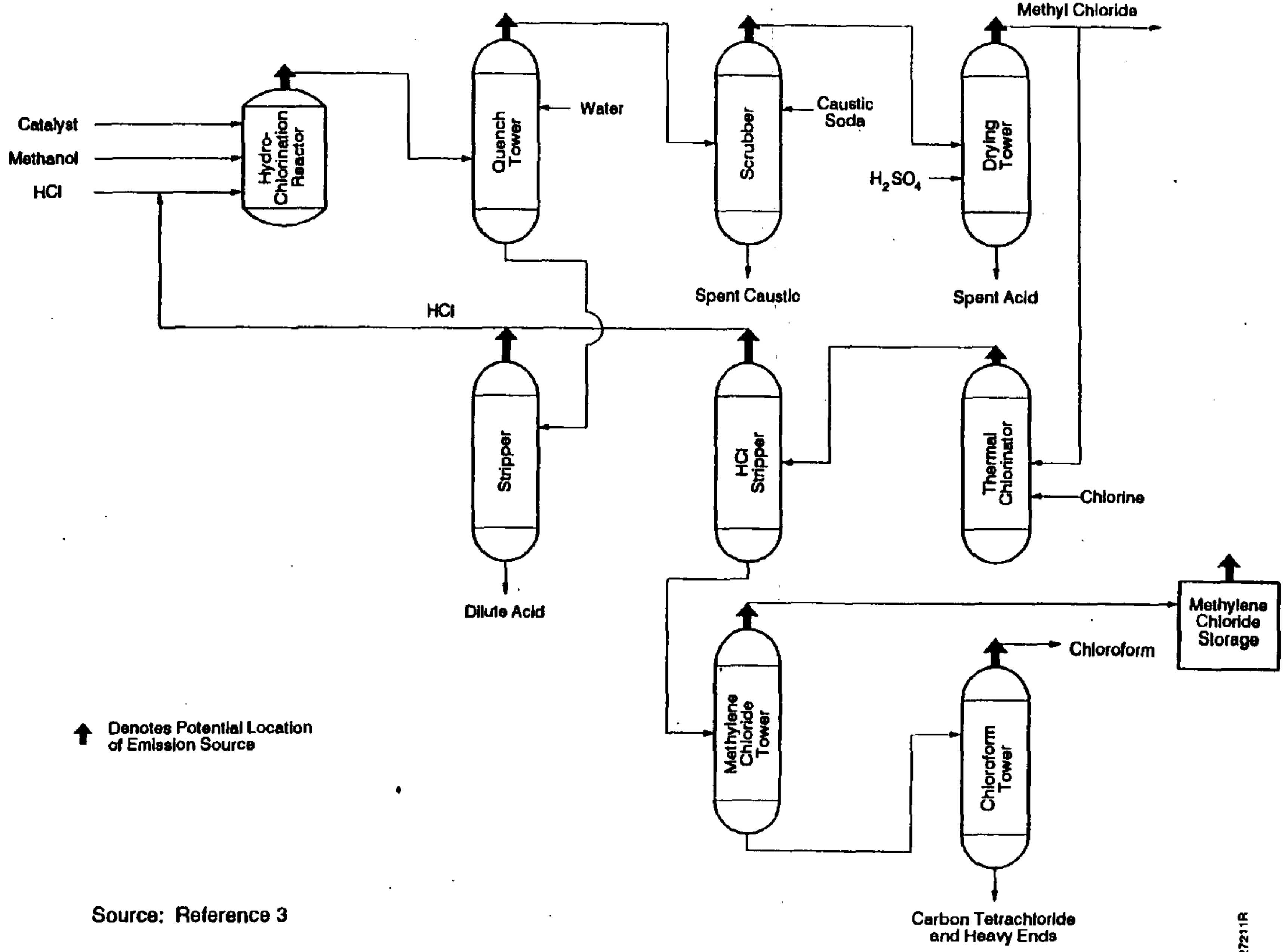
Equipment Leak Emissions

Equipment emissions result from leaking process equipment that contains either liquid or gaseous MC. These emissions may occur intermittently or continuously. The largest sources of equipment leaks reported by MC production facilities in 1985 were from process valves, flanges, pressure relief devices, and pump seals.[3] Other production process components that may leak include compressors, open-ended lines, and sample connections.

Table 5 presents control techniques and efficiencies applicable to equipment leak emissions.

Storage Tank Emissions

Methylene chloride storage tank emissions result from breathing losses due to changes in barometric pressure and temperature, and working losses due to volumetric changes in the tank from filling or dispensing stored solvent. Outdoor tanks, because they are subjected



Source: Reference 3

Figure 3. Process flow diagram for the production of Methylene Chloride and co-products by the hydrochlorination of methanol.

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TABLE 5. CONTROL TECHNIQUES AND EFFICIENCIES APPLICABLE TO EQUIPMENT LEAK EMISSIONS

Equipment Component (Emission Source)	Control Technique	Percent Reduction
Pump Seals		
Packed and Mechanical	Seal area enclosure vented to a control device (closed-vent system)	100
	Monthly LDAR	61
	Quarterly LDAR	33
Double Mechanical[a]	Closed-vent system	[b]
Compressors	Vent degassing reservoir to control device (closed-vent system)	100
Flanges	Annual LDAR program	[b]
Valves		
Gas	Monthly LDAR	73
	Quarterly LDAR	64
Liquid	Monthly LDAR	59
	Quarterly LDAR	44
Pressure Relief Devices		
Gas	Monthly LDAR (safety concerns)	50
	Quarterly LDAR (safety concerns)	44
	Rupture Disk w/closed-vent system	100
Liquid	N/A	[b]
Sample Connections	Closed-purge Sampling	100
Open-ended Lines	Caps/plugs/flanges/secondary valves	100

Source: Reference 7.

[a]Assumes the seal barrier fluid is maintained at a pressure above the pump stuffing box pressure and the system is equipped with a sensor that detects failure of the seal and/or barrier fluid system.

[b]Not established.

LDAR = Leak detection and repair
N/A = Not applicable

to greater diurnal temperature variation, have a greater potential for MC emission losses than indoor tanks.

Storage tank emissions are controlled through tank modifications (i.e., by adding an internal floating roof to a fixed-roof tank), use of a conservation vent, or by collecting and routing vapors from the storage tank to a control device such as a condenser. A conservation vent, which is a type of pressure- and vacuum-relief valve, is commonly installed on fixed roof tanks to contain minor changes in vapor volume. The use of these valves prevents the release of vapors during times when there are only small pressure differentials (e.g., ± 0.2 kPa). Emissions reduction achieved by the use of these valves are dependent on the vapor pressure of the stored liquid. Conversion of a fixed-roof tank to a floating roof could reduce MC emissions by roughly 80-90 percent, depending on the tank design, type of roof seals and fittings, temperature, throughput, number of turnovers, and other factors.[6] Condensers and other product recovery or combustion control devices can be designed for 95 percent efficiency.

Transfer Emissions

Transfer emissions from MC production processes occur from loading MC into tank cars, trucks, or barges for transport. Fugitive emissions during transfer can result through the hatches and other openings of tank trucks and tank cars that are not vapor tight. Loading losses occur by three mechanisms: displacement of vapors that are transferred into the vehicle via the vapor balance system as the previous product was unloaded; displacement of vapors formed in the empty tank by evaporation of residual products from previous loads; and vapor displacement and volatilization as a result of turbulence and vapor/liquid contact during loading of the new product. Transfer emissions may be controlled by vapor balancing, where MC vapors are returned to the storage tanks and the use of submerged loading rather than splash loading. In splash loading, the fill pipe dispensing the chemical is lowered only partway into the transport vessel (i.e., barge, tank car, or tank truck). Significant turbulence and vapor/liquid contact occur during splash loading, potentially resulting in a high degree of vapor generation and loss, submerged loading (submerged fill pipe method and bottom-loading method) involves loading a fill pipe opening that is below the liquid surface level for most of the loading operation; therefore, minimizing liquid turbulence and reducing the vapor generation that occurs with splash loading. The reader is referred to EPA Publication No. AP-42, Section 4.4.2 for the estimation of loading losses. Alternatively, transfer emissions may be vented to a product recovery device or a combustion device. A product recovery device uses refrigeration, absorption, adsorption and/or compression. The recovered product is piped back to storage. Combustion is generally through thermal oxidation, without any recovery. Both product recovery and combustion methods can be designed to achieve over 95 percent emission reduction.

Process Vents

Production processes may emit MC through process vents from the reactors and distillation columns. These process vent streams are typically routed through product recovery devices (e.g., scrubbers, condensers) as part of the production process, so much of the MC is recovered before the vent stream is emitted to the atmosphere.

No emission factors were found for process vent emissions, which would be highly site-specific. Emission estimates supplied by MC production plants for 1983 are included in the "Emission Estimates" part of this section. In order to further reduce emissions, vent streams could be routed to a combustion device after the final recovery device. Combustion devices can reduce VOC emissions by about 98 percent.[8] No data specific to MC reduction efficiencies by combustion were available at the time this study was conducted.

Secondary Emissions

Secondary emissions from MC production occur from on-site and off-site treatment and disposal of process-generated wastewater, liquid waste, or solid waste. Waste streams can be generated from any of the operations shown in Figures 2 and 3.

There is a potential for air emissions when MC-containing wastewater comes in contact with the ambient air as the wastewater passes through collection and treatment units. Factors that affect the magnitude of emissions include the MC concentration, wastewater temperature, and collection and treatment system design.

Several types of controls apply to MC emissions from waste and wastewater, including:

- Covers or enclosures such as fixed roofs, floating roofs, and floating membranes;
- Covers or enclosures with closed-vent systems and control devices such as carbon adsorbers or vapor incinerators;
- Treatment processes to remove MC;
- Waste incineration; and
- Process modifications to reduce the amount of MC wasted.

Efficiencies achievable by some of these types of controls are shown in Table 6.[9,10]

Controls and estimated control efficiencies at facilities producing MC in 1985, based on information reported by six facilities, are presented in Table 7.[3]

EMISSION ESTIMATES

Emissions from MC production processes are determined by site-specific sources; therefore, parameters for estimating emissions may vary from site to site. Whenever possible, emissions derivations should be specific to the facility.

Storage tank emissions for fixed-roof storage tanks and floating roof storage tanks for a particular site can be estimated by incorporating site-specific parameters using the EPA Publication No. AP-42 emission factors for storage of organic liquids.[11] Site-specific parameters include, but are not limited to, tank diameter, tank capacity, average diurnal temperature change, turnover factor, average vapor space height, and plant factors. Most storage tanks reported by MC production facilities in 1985 were fixed-roof storage tanks, with only one report of a floating roof storage tank.[3] The equations

TABLE 6. WASTE AND WASTEWATER EMISSION CONTROL TECHNIQUES AND EFFICIENCIES

Type of Control	Control Technique	Efficiency (%)
Cover on storage or treatment tank	Fixed roof	86-99[a]
	External floating roof	93-97[a]
	Internal floating roof	93-97[a]
Cover on surface impoundment	Floating membrane	85
Cover with closed-vent system routed to control device	Carbon adsorber	95
	Condenser	95
	Thermal and catalytic vapor incinerators	98
	Flare	98
Treatment	Steam stripping	99
	Thin film evaporation	99
Waste incineration		99.99

Source: References 9 and 10.

[a] Dependent on concentration of MC in waste stream.

TABLE 7. 1983 REPORTED CONTROLS AND CONTROL EFFICIENCIES FROM FACILITIES PRODUCING METHYLENE CHLORIDE

Company/Location	Type of Emission/Source	1983 Controls	Reported Control Efficiency
Diamond Shamrock	Process		
Belle, WV	• Regeneration Vent	None	0
	• Vent Recovery System 1	Condenser	68.5
	• Vent Recovery System 2	Condenser	26.7
	Equipment Leaks		
	Storage	None	0
	• Fixed-Roof Tank	Conservation Vent Water Cooled Condenser	62.4
	• Fixed-Roof Tank	Conservation Vent Water Cooled Condenser	86.7
	• Fixed-Roof Tank	Conservation Vent Water Cooled Condenser	86.7
	• Fixed-Roof Tank	Conservation Vent Water Cooled Condenser	86.7
	• Fixed-Roof Tank	None	0
	• Fixed-Roof Tank	None	0
	• Fixed-Roof Tank	Conservation Vent Water Cooled Condenser	41.9
	• Fixed-Roof Tank	Conservation Vent Water Cooled Condenser	41.9
	• Fixed-Roof Tank	None	0
	• Fixed-Roof Tank	None	0
	• Fixed-Roof Tank	None	0
	• Fixed-Roof Tank	None	0
	• Fixed-Roof Tank	None	0
	• Fixed-Roof Tank	None	0
	• Fixed-Roof Tank	Conservation Vent Water Cooled Condenser Refrigerator Condenser	90.7
	• Fixed-Roof Tank	Conservation Vent Water-Cooled Condenser	62.4
	Equipment Opening	None	0

TABLE 7. (CONTINUED)

Company/Location	Type of Emission/Source	1983 Controls	Reported Control Efficiency
	Transfer		
	• Tank cars, tank trucks	None	0
	• Barges	None	0
	Secondary		
	• Wastewater Treatment Influent	Steam Stripping/ Carbon Adsorption	N/R
	• Solid Waste Drumming	Landfill	N/R
	• Sludge disposal	Off-site Treatment	N/R
	Relief Devices	N/A	
Dow Chemical Freeport, Texas	Equipment Leaks	None	0
	Storage		
	• #	#	#
	Equipment Opening	None	0
	Handling		
	• Tank trucks, tank cars, ships, barges	None	0
	• Drums	Flume vacuum system	N/R
	Secondary		
	• Wastewater rain and washdown	Nonbiological treatment	0
	• Spent filter elements	Material and Energy Recovery Unit	N/R
Dow Chemical Plaquemine, LA	Equipment Leaks	None	0

TABLE 7. (CONTINUED)

Company/Location	Type of Emission/Source	1983 Controls	Reported Control Efficiency
	Storage		
	• Fixed-Roof Tank	None	0
	• Fixed-Roof Tank	None	0
	• Fixed-Roof Tank	None	0
	• Fixed-Roof Tank	None	0
	• Fixed-Roof Tank	None	0
	• Contact Internal Floating-Roof	N/A	
	Equipment Opening	None	0
	Handling		
	• Tank truck, tank car, barges	None	0
	Secondary	None	0
	• Not identified		
	Relief Devices	N/A	0
LCP Chemicals Moundsville, WV	Process		
	• Purge Condenser	Compression and Condensation	N/R
	• Recovery Tank	None	0
	Equipment Leaks	None	N/R
	Storage		
	• Fixed Roof Tank	None	0
	• Fixed Roof Tank	None	0
	• Fixed Roof Tank	None	0
	• Fixed Roof Tank	None	0
	• Fixed Roof Tank	None	0
	• Fixed Roof Tank	None	0
	• Fixed Roof Tank	None	0
	Handling	None	0
	• Rail cars, truck		

TABLE 7. (CONTINUED)

Company/Location	Type of Emission/Source	1983 Controls	Reported Control Efficiency
	Secondary		
	• Not Identified	Distillation and Recovery	N/R
	• Not Identified	Neutralization and	N/R
	• Not Identified	Carbon Adsorption Off-site	N/R
	Relief Devices	N/A	
Vulcan Chemicals Geismar, LA	Process Vents	#	#
	Equipment Leaks	#	#
	Handling	#	#
	Secondary	#	#
	Relief Devices	#	#
Vulcan Chemicals[a] Wichita, KS	Process Vent	#	#
	Equipment Leaks	#	#
	Storage	#	#
	Equipment Opening	#	#
	Handling	#	#

Source: Reference 3.

This information is considered by the company to be confidential.

[a] Company reported greater than 98 percent control, but 98 percent was used in the absence of supporting test data.

N/A = Not Applicable
N/R = Not Reported

for the estimation of storage emissions for a fixed-roof storage tank using AP-42 methodology are presented in Appendix A.

The AP-42 section for evaporative losses from organic liquid storage tanks was available in the October 1992 update to AP-42 known as Supplement E. The update addresses changes that have occurred to the emissions estimation equations for fixed and floating roof storage tanks. A computer model called "TANKS," which incorporates the equation changes and calculates emissions, has also been developed as an aid in performing the extensive and detailed calculations required to estimate emissions. The model contains look-up tables of default values for equation variables when site-specific inputs are not known. It can address situations of both single component liquids or mixtures of compounds within a tank. The model can be obtained from EPA and was made available to the public in September 1992 through the Office of Air Quality Planning and Standards' (OAQPS') Technology Transfer Network (TTN) Clearinghouse for Inventories/Emission Factors (CHIEF) Bulletin Board. The TTN is operated by the Technical Support Division of OAQPS in Research Triangle Park, North Carolina.

As with storage tank emissions, transfer emissions estimation using EPA Publication No. AP-42 factors requires site-specific handling inputs (i.e., dome loading, splash-fill loading, submerged fillpipe, etc.).

Emission estimates for equipment leaks can be calculated in any one of the five ways presented in the EPA publication "Protocols for Generating Unit Specific Emissions Estimates" (the "Protocols" document).[12] The five methods differ in complexity, with the more complex methods yielding more reliable emission estimates.

The simplest method requires that the number of each component type, the MC content of the stream, and the time that the component is in service be known. These values are multiplied by the EPA's average emission factors for the Synthetic Organic Chemical Manufacturing Industries (SOCMI). The SOCMI factors are presented in Table 8. This method is thought to overestimate actual equipment leak emissions; therefore, it should be employed only when other data are not available. Using this method, estimated emissions for each component are calculated by the following equation.[12]

TABLE 8. AVERAGE EMISSION FACTORS FOR EQUIPMENT LEAK EMISSIONS

Equipment	Service	Emission Factor kg/hr/source (lb/hr/source)
Valve	Gas	0.0056 (0.012)
	Light Liquid	0.0071 (0.016)
	Heavy Liquid	0.00023 (0.00051)
Pump Seals	Light Liquid	0.0494 (0.109)
	Heavy Liquid	0.0214 (0.472)
Compressor Seals	Gas/Vapor	0.228 (0.503)
Pressure Relief Seals	Gas/Vapor	0.104 (0.229)
Flanges	All	0.00083 (0.0018)
Open-Ended Lines	All	0.0017 (0.0037)
Sampling Connections	All	0.0150 (0.033)

[a] Reference 13.

Emissions from Component	=	Number of Equipment Components	·	Percent Weight of MC in Stream	·	Component-Specific Emission Factor	·	Number of Hour per year MC Component in Ser'

An example using this methodology is presented in Appendix A.

As noted, more accurate equipment leak emission estimates can be obtained by one of the more complex estimation methods. Emission measurement is required in varying degrees for the other four methods. These methods are discussed briefly in the following text. For further calculation details, the reader is referred to the "Protocols" document.

The second method, the leak/no leak approach, is based on the determination of the number of leaking and non-leaking components. These values are multiplied by two different sets of EPA-derived emission factors. The third method divides measurement data results into three ranges; (1) 0-1,000 ppmv, (2) 1,001-10,000 ppmv, and (3) greater than 10,000 ppmv. The number of each component within each range is then multiplied by the component-specific emission factor delineated by the EPA for that range. The fourth procedure uses measurement data along with correlation equations derived by the EPA in earlier work. The fifth method allows the facility to develop its own correlation equations by using more rigorous testing, bagging and analysis of equipment leaks to determine mass emission rates.[12]

The current "Protocols" document was published in 1988. It is currently under revision. The reader is encouraged to refer to the latest version when estimating emissions from equipment leaks.

An emission factor derived for the entire MC production process is presented in Table 9. This factor was derived from 1983 aggregate emission production totals for MC producers with 1983 controls. Site-specific parameters will vary and it is recommended that current site-specific emission factors be used. Also included in Table 9 are equipment leak, storage, and inert gas purge vent product recovery condenser emission factors for both methane chlorination and methyl chloride chlorination MC production processes.[14]

TABLE 9. EMISSION FACTORS FOR METHYLENE CHLORIDE PRODUCTION

Process	Source	Emission Factor [g/kg MC produced (lb/ton MC produced)]
Methane Chlorination	Inert gas purge vent product recovery condenser	0.14 (0.28)
Methane Chlorination	Storage	1.02 (2.04)
Methyl Chloride Chlorination	Inert gas purge vent product recovery condenser	0.03 (0.052)
Methyl Chloride Chlorination	Storage	2.46 (4.92)
Methylene Chloride Production	Entire process	3.00 (6.00)
Wastewater Treatment	Publicly owned treatment works	520 g/kg MC influent (1040 lb/ton MC influent)

NOTE: These emission factors were obtained from the XATEF data base;[14] no information was supplied from the data base on the number of tests or facilities used to derive the factors. It is known, however, that the factor derived for MC production (entire process) was from the six plants in operation in 1984.[3] It is suggested that facility-specific information be used with the AP-42 and "Protocol" documents referenced in the text to produce more accurate site-specific emission estimates.

Source: Reference 14.

One emission factor that can be used to estimate MC emissions based on MC influent to a publicly owned treatment works facility was found in the literature and is presented in Table 9.[14] Emissions of MC from wastewater can be more accurately estimated using site-specific data with the methodology presented in the EPA Control Technology Center (CTC) document, "Industrial Wastewater Volatile Organic Compound Emissions -- Background Information for BACT/LAER Determinations."[10]

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SECTION 5
EMISSIONS FROM USES OF METHYLENE CHLORIDE

The major industrial uses of MC include the production of paint strippers (removers) (31 percent of total MC production); plastics (16 percent); polyurethane foam (14 percent); pharmaceuticals (11 percent); degreasing operations (11 percent); aerosol production (8 percent); and photoresist stripping (4 percent). The remaining 5 percent is consumed by various miscellaneous industries such as pesticide production and photographic film processing.

This section presents the process descriptions, emission sources, and emission controls and control efficiencies for the above industrial use categories. When known, emissions estimates and emissions factors or estimation methodologies are provided.

PAINT STRIPPER INDUSTRY

The formulation and use of paint strippers is discussed here. Because little information is available on emissions of MC from formulation and use of paints and coatings, the use of MC for this purpose is discussed with other miscellaneous industrial uses of MC at the end of this section.

A paint stripper is defined as a liquid, liquefiable, or mastic composition whose primary function is to penetrate, blister, and remove paint.[1] A list of 113 U.S. facilities that formulate paint strippers was identified by the U.S. Environmental Protection Agency in 1987.[2] Appendix B includes the names and locations of these facilities. Responses to EPA Section 114 questionnaires pertaining to MC and several other chlorinated organic emission sources with and without emission controls in the paint stripping industry were collected. These include twelve paint stripper formulator facilities, six aircraft maintenance facilities, six military facilities, two automobile producers, and one furniture repair facility.[2,3] The specific facilities are listed in the tables provided with this section.

Separate estimates of MC used in the paint stripping industry range from 61,600 Mg and 74,000 Mg annually.[4] The use of paint strippers is divided into six major sectors: (1) aircraft maintenance, (2) automobile applications, (3) industrial applications, (4) military applications, (5) furniture manufacture, and (6) household use. An estimate of the MC used by each sector is presented in Table 10. Paint strippers for industrial use typically contain 70-90 percent MC by weight; household paint stripping products typically contain 60-80 percent.[5]

Methylene chloride has many properties that make it a highly effective active ingredient. It easily penetrates, blisters, and lifts paints from many substrates. It is also high in solvency, low in flammability, and is not corrosive or damaging to metal or wood surfaces.[4] All of these properties, plus MC's relatively low price, have prevented the substitution of other solvents in significant quantities. The decrease in the amount of MC used in paint stripping has been slow, but changes in OSHA regulations may increase the incentive for development and use of substitutes.

For any operation, emissions are released from two types of sources at a facility--building openings and process vents. Building openings include general ventilation, doorways, windows, and other fugitive loss points. Process vents include emissions related to a specific process function, which do not enter the in-plant air, but are emitted directly to the atmosphere through a pipe or duct. An exhaust stack from an automotive refinishing spray booth is an example of a process vent.

Process Descriptions

This section discusses paint stripper formulation processes and their use in stripping operations.

Formulation--

Methylene chloride is generally supplied to paint stripping facilities by a contracted chemical supplier. It is usually delivered by tank car; however some smaller facilities may buy MC in 55-gallon drums. Most facilities store MC in large, outdoor, fixed-roof tanks.

TABLE 10. METHYLENE CHLORIDE CONSUMPTION IN 1987 BY PAINT STRIPPER SECTOR

Sector	Methylene Chloride Used[a] (Mg/yr)
Automotive	15,400
Military Maintenance	14,500
Household	13,200
Other Industrial	10,100
Aircraft[b]	5,900
Commercial Furniture[c]	4,400
TOTAL	63,500

Source: Reference 3.

[a] Values shown represent the total MC present in the annual paint stripper use by each sector.

[b] Aircraft facilities include all maintenance and manufacturing operations, but do not include military aircraft.

[c] Commercial furniture includes all paint stripping removal operations performed with office or residential furniture that are not typically performed by consumers.

The paint stripper formulation process occurs in mixing tanks ranging from several hundred to several thousand gallons in volume. Mixing tanks are normally top-filled to three-quarters capacity. The MC may be pumped directly from a storage tank or poured into the batch directly from a 55-gallon drum. After the addition of an activator, a corrosive inhibitor, an evaporation retarder, and a thickener, the resulting product batch is heated to approximately 32°C and mixed for several hours. After mixing, the paint stripper is pumped to an automatic or manually operated filling machine. The product then typically flows through a nozzle inserted through a bung hole on the top of each container. This process can vary from two to ten hours, depending on the size of the product batch.[2]

Stripping Operations--

Most automobile plants use MC-based paint strippers to clean paint spray booths. In this process, the stripper is typically sprayed onto the interior surfaces of the spray booth, allowed to penetrate until the paint blisters, and then removed with a water wash. In addition, many automotive plants use dip tanks to strip paint from automobile parts or assembly equipment. Details of the dipping process vary from plant to plant.

The other major use of MC in industrial plants is to remove paint from floors. For this process, workers manually apply stripper and remove paint by mopping and scraping. Some plants also use paint strippers to purge paint lines. This stripping occurs in an essentially closed system. Stripper is pumped into the lines, allowed to stand, and pumped out when the lines are purged. The used stripper is recovered for reuse, treatment, or disposal.[3]

Methylene chloride-based paint strippers are used to remove paint overspray and clean defective paint jobs in general assembly line operations used to manufacture durable goods.[3] These processes are similar to those used at automobile assembly plants in that the cleaning is done manually in open processes.[3] Some facilities also use MC to clean conveyor hooks.[5]

In commercial aircraft repainting, MC-based paint removers are sprayed onto the aircraft or part surface as a fine mist and allowed to blister the paint. The paint is then washed off with non-metallic scrapers and is finally washed with water or a solvent rinse.[5] Eighty percent of the MC used in this process evaporates and is emitted through building openings. The remaining MC is collected as runoff from the spraying procedure. This process occurs in large general maintenance aircraft hangars.[3]

Military paint stripping processes are a combination of aircraft and automobile processes. Most of the data associated with these categories are related to aircraft maintenance operations.

In commercial furniture refinishing, paint or varnish is removed by one of four methods. The most common method is by the use of a dip tank. This process is completed by dipping the furniture into an open tank of stripper for a designated time or until the paint blisters. Afterwards, the paint is scraped off manually. This process may be repeated several times if the paint is difficult to dry. A second method is the flow-over system. This system automatically pumps stripping solution to a brush that mechanically sweeps the furniture. Excess stripper is recycled back into the system. Once blistering occurs, the paint is manually scraped off. The spent solution is either recycled, disposed of as hazardous waste, or left on site to evaporate.[5] The third method uses a combination of the dip tank and flow-over system in series. The fourth method is simply manual application and removal.[5]

Most paint stripper consumed by the household sector is used to strip furniture.[5] Consumers who strip furniture themselves typically apply stripper with a brush and remove the paint with a scraper. Insufficient information is available, however, to characterize the emissions of MC from this process.[3]

Emissions

Emissions data are available for paint stripping formulators and for some of the processes that use MC-based paint strippers. However, data for all the end-uses are not available. Some of the end-use data, such as those for aircraft and automotive facilities, are included together because their processes and emission releases are similar. Other end-use categories for which emissions data are well established are presented individually.

Paint Stripper Formulators--

Sources of MC emissions from paint stripper formulation include storage, handling, equipment leaks, and secondary sources. Storage tank emissions are the result of breathing losses and working losses. Breathing losses are mainly caused by diurnal changes in temperature, which can cause expansion and contractions of the tank. Working losses are caused by filling or dispensing of the stored solvent, which in turn forces MC vapors out of the void space of the tank. Emissions from storage tanks are released either indoors or outdoors depending on the tank location. Indoor storage tanks are assumed to have negligible breathing-loss emissions because indoor diurnal temperature changes are expected to be minimal. If pressurized tanks are used to store solvents under pressures greater than atmospheric, they do not have significant emissions.[2]

Handling emissions are the result of mixing tank operations and product container filling. Current data suggest that the major source of handling emissions are from the mixing operations. These emissions may be released through general building openings or process vents associated with mixing. In facilities that do not have process vents for the mixing stage of production, all associated emissions would be manifested as fugitive releases from building openings.

Emissions from process equipment components occur when the liquid or gas process streams leak from the equipment. Process equipment components upstream from the mixing tank typically contain solvent at all times, and equipment leak emissions associated with them are also continuous. The process equipment downstream from the mixing tank is cleaned and drained after each product batch. These emissions only occur during operating hours.

Secondary emissions include MC release associated with the disposal of wastewater, solid waste, liquid waste, and accidental spills.

Emission controls that may be incorporated in the storage tank and mixing area include MC transfer controls (e.g., dome lead, splash-fill, submerged fill-pipe), refrigerated condensers in storage tank areas, and venting combined with carbon adsorbers. A chilling coil with the capacity to lower the MC temperature from 25°F to -7°F at a rate of 220 g/s (approximately 30,000 Btu/hr), will lower the vapor pressure of MC by more than 75 percent.[2] Equipment leaks can be controlled using a regularly scheduled leak detection and repair (LDAR) program. Leak detection can be accomplished visually or using a portable VOC analyzer to "sniff" around equipment components.

As discussed in Section 4, MC emissions from wastewater and wastes can be controlled by treating to reduce MC, and prior to treatment, by using covers and enclosures, either alone to suppress emissions, or with a closed vent system that captures emissions and routes them to a control device. Treatment techniques applicable to MC-containing wastes and wastewaters include steam stripping, thin film evaporation, and incineration.

Table 11 shows the results of emission control techniques as they apply to specific formulation process components. This table includes controls examined for a previous project, and therefore does not include all the controls discussed above. Emission controls have been the most effective on the two highest sources of emissions, storage and mixing. Refrigerated condensers or carbon adsorbers applied to these sources have been estimated to have an emission reduction efficiency of 95 percent. As discussed in Section 4, internal floating roofs applied to MC storage tanks can reduce emissions by 80 to 90 percent relative to fixed-roof tanks.

Emission estimates for paint stripper formulators were estimated from the responses of 12 facilities to an EPA Section 114 questionnaire during a 1987 EPA project. The emissions estimates were developed from data on the annual consumption of MC and questionnaire information on the emission points associated with the formulation process. Emissions were categorized into storage emissions, handling emissions, and equipment leaks. The estimates developed for the 12 facilities responding to the questionnaire were used to represent the other 101 facilities that EPA had identified. To estimate storage tank emissions for the facilities that were not sent questionnaires, outdoor fixed roof storage tanks were used to calculate the emission factors used to estimate emissions from "typical" facilities because most storage tanks are outdoors.[2]

TABLE 11. CONTROL TECHNIQUES FOR EMISSIONS OF CHLORINATED SOLVENTS FROM PAINT STRIPPER FORMULATORS

Emission Source	Additional Controls	Emission Reduction Efficiency (%)
Storage Tank	Refrigerated condenser	95[a]
Mixing Tanks (Handling)	Carbon adsorption[b]	95[c]
	Refrigerated condenser[b]	95[a]
Equipment Leaks[d]		
Pump Seals (packaged and	Monthly LDAR[e]	61[f]
mechanical)	None analyzed	--
Flanges	Monthly LDAR	59[f]
Valves (liquid)	Monthly LDAR	73[f]
Valves (gas)	Closed-purge sampling	100[f]
Sample Connections	Caps on open ends	100[f]
Open-Ended Lines		
Secondary Sources	Covers, enclosures, treatment, incineration	85-99.99

[a] Control Technologies for Hazardous Air Pollutants. EPA-625/6-86-014. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, September, 1987. p. 24.

[b] Control option also includes covering the mixing tank and installing ductwork from the mixing tank to the adsorber or condenser to recover chlorinated solvent emissions.

[c] May, P. and G. Bockol, Memorandum: Assessment of Carbon Adsorbers for Control of Hazardous Air Pollutants. Prepared by Radian Corporation for L. Evans of the U.S. Environmental Protection Agency, December 1, 1986.

[d] Reference 10.

[e] "LDAR" means leak detection and repair.

[f] Percent reduction in VOC emissions based on the emission factors shown in Table A-1 of Appendix A. Methylene chloride emissions are assumed to be reduced by the same percent as total VOC emissions.

These estimates were made by making many assumptions, however. To obtain reliable emissions estimates for an individual site would require additional site-specific information. As discussed in Section 4 for MC producers, site-specific emission estimates can be developed using the AP-42 methodologies for storage tanks, the "Protocols" methodologies for equipment leaks, and the wastewater CTC document methodology for wastewater. Example calculations are given in Appendix A.

National emissions from paint stripper formulators were estimated to be 26,500 Mg/yr in 1988. As of the 1987 study, there were no State regulations requiring emissions reductions. Therefore, implementation of emission controls in the industry were not common at that time. Emissions were separated into emissions from storage, handling, equipment leaks, and secondary sources; emissions estimates are shown in Table 12. The typical model plant emitted about 179 Mg/yr, and 178 Mg of this was from handling (mostly mixing tank) emissions. However, individual plant emissions ranged from about 7 to over 7,000 Mg/yr.

Lower MC content products are currently being developed because of worker exposure issues and consumer demand.[4] Reduction in emissions may occur as paint stripper formulations are developed with lower MC content. However, estimates of emissions reductions that may result from lowering the MC content of finished products have not been made.

Paint Stripping Processes--

For each type of paint stripping process, emissions are segregated into three categories; building openings, process vents, and outdoor storage. Emissions from most paint stripping processes are released through building openings or other openings, such as windows and doors. Other building opening sources include general maintenance operations.

Emissions from these sources were estimated in 1987 during a previous EPA project.[2] The data are more extensive for larger, well-defined industries. Paint stripping emissions estimates are not available for commercial (e.g., metal, office, residential) furniture facilities. In general, a material balance approach was used to

TABLE 12. ESTIMATED METHYLENE CHLORIDE EMISSIONS FROM PAINT STRIPPER FORMULATORS (1988)

		Methylene Chloride Emissions (Mg/yr)[a]						
					Equipment Leaks			
Company Name	Location	Total	Storage	Handling	Outdoor	Indoor	Secondary	Accidental Releases
Benco Sales Inc.	Crossville, TN	87.3	2.5	83.6	0.8	0.03	NR	0.3
Benco Sales Inc.	Fontana, CA	33.3	2.1	30.1	0.8	0.04	NR	0.2
Hillyard Chemical Co.	St. Joseph, MO	140.6	4.2	136.3	0.06	0.04	NR	NR
Jasco Chemical Corp.	Mountain View, CA	110.6	3.8	105.4	1.0	0.3	NR	NR
Kwick Kleen Industrial Solvents	Vincennes, IN	6.9	2.4	4.5	0	0.01	NR	NR
Pennwalt Corp. (Turco)	Carson, CA	17.9	1.6	14.9	1.0	0.4	0.03	NR
Pennwalt Corp. (Turco)	Marion, OH	25.2	1.2	23.0	1.0	0.1	NR	NR
Sherwin Williams Co.	Chicago, IL	44.4	2.5	40.6	1.0	0.3	NR	NR
Sherwin Williams Co.	Richmond, KY	434.7	0	433.9	0.8	0.03	NR	NR
Star-Bronze	Alliance, OH	134.1	9.7	123.1	0	1.3	NR	NR
Stripping Products (Bix)	Old Hickory, TN	7.2	1.3	3.9	2.0	0.007	NR	NR
W.M. Barr and Co., Inc.	Memphis, TN	7,046.8	0	7,044.0	2.2	0.6	NR	NR
Model Plant[b]		178.8	0.6	177.9	0.26	0.06	NE	NE
TOTAL[c]		26,500	92	26,010	31	9.3	0.03	0.5

[a] "NR" means no emissions were reported in the questionnaire response. "NE" means emissions were not estimated.

[b] The model represents each of the 101 paint stripper formulation facilities that did not receive a questionnaire. See Appendix B for a list of these companies. Emission estimates for the model plant were developed from the questionnaire responses completed by the 12 facilities.

[c] The total emission estimates represent emissions from all 113 paint stripper formulators.

estimate emissions from each type of stripping process. Tanks were assumed to contain only MC for purposes of estimating emissions. Because paint strippers contain other compounds, such as waxes to retard evaporation, this assumption may slightly overestimate these emissions.

Emissions from use and storage of paint strippers inside buildings are emitted through building openings. For general maintenance and other miscellaneous uses, it was assumed that all of the MC consumed is emitted to the atmosphere. For indoor storage tanks, emissions were calculated using AP-42 equations for fixed-roof storage tanks; the emissions would be released from building openings.

Process vents, such as vents that are routed to the atmosphere from spray booths in automobile assembly, are generally considered to have emissions equal to the rate of MC consumption.

Outdoor storage emissions were based on AP-42 equations for fixed-roof storage tanks. However, many facilities store MC in 55-gallon drums, for which emissions are negligible.

The national total emissions for consumers of MC for paint stripping purposes were estimated at 41,900 Mg/yr in 1987. Emissions from each industry are discussed below.

Automobile assembly emissions of MC that were received in response to a Section 114 questionnaire in 1987 are presented in Table 13. In a previous study, an emission factor was derived from an emissions-to-consumption ratio based on the questionnaire responses, and was applied to all automotive facilities not included in the survey. This emission factor was 0.8 Mg MC_e/MC_c, where MC_e and MC_c represent MC emitted and consumed, respectively.[3] Total national emissions in 1987 from automotive facilities were then estimated to be 12,320 Mg/yr.

Aircraft maintenance facilities emissions are estimated by an emission factor derived from material balance. The total emissions

TABLE 13. ESTIMATED METHYLENE CHLORIDE EMISSIONS FROM TWELVE AUTOMOBILE MANUFACTURING FACILITIES, 1987[a]

		Methylene Chloride Emissions (Mg/yr)			
Company Name	Location	Process Vents	Building Vents	Outdoor Sources	Total
General Motors	Anderson, IN	0	10.5	0	10.5
General Motors	Atlanta, GA	102.0	0	0	102.0
General Motors	Baltimore, MD	124.0	0	0	124.0
General Motors	Bowling Green, KY	9.4	0	0	9.4
General Motors	Columbus, OH	0	196.8	0[b]	196.8
General Motors	Flint, MI	9.7	48.7	0	58.4
General Motors	Kansas City, MO	46.1	7.4	0	53.5
General Motors	Lordstown, OH	199.2	95.5	0	294.7
General Motors	Moraine, OH	199.2	95.5	0	294.7
General Motors	Pontiac, MI	19.8	0	0	19.8
General Motors	Shreveport, LA	33.1	0	1.9[c]	35.0
Ford	Ypsilanti, MI	0	0.2	0	0.2
TOTAL		742.5	454.6	1.9	1,199.0

Source: Reference 3.

[a] This table represents MC emissions estimated only for those automobile manufacturing facilities that completed a Section 114 questionnaire response.

[b] The storage tank at this facility is an outdoor tank and is reportedly controlled; however, insufficient information was available to estimate emissions.

[c] Outdoor dip tank.

for this industry in 1987 were estimated to be 4,720 Mg/yr MC using the same emission factor (0.8 Mg MC_e/MC_c) that has been used in the automotive sector, since the process is similar.

Military emissions can be from a variety of sources. The largest sources identified are aircraft and automobile maintenance. For these activities, emission estimates of 40 percent and 80 percent of MC consumed were applied to all facilities with and without dip tanks, respectively. The 80 percent figure is derived from the data in the aircraft and automotive section.[3] Dip tanks are used for most military paint stripping operations. Nationwide military consumption of MC has been estimated at 14,500 Mg/yr.[3] Emissions have been estimated to be 6,400 Mg/yr using a combination of the 40 percent and 80 percent emission factors. Emissions identified for individual facilities are presented in Table 14.

Household uses consumed approximately 13,200 Mg/yr of MC in 1987.[3] Household emissions are estimated using the material balance approach. The amount emitted is assumed equal to the amount of MC in the product, usually 80 to 90 percent.[6] The emissions-to-consumption ratio (emission factor) for household use as well as automobile and aircraft use is shown in Table 15.

Emission control techniques can be generally applied to each segment of the users of paint strippers, with the exception of household use. Refrigerated condensers and carbon adsorbers may be installed, and obtain similar emission reduction efficiency to that indicated for paint stripper formulators. These can be used for vented storage tanks and stripping operations. Floating roofs may also be applied to fixed-roof storage tanks. Dip tanks may also incorporate increased water cover and drain time as well as a carbon adsorber. The emission reduction efficiency for dip tank controls is from 50 to 60 percent. The efficiencies of these techniques are summarized in Table 16.[3]

The overall efficiency of emission controls at automotive and aircraft maintenance facilities have both been estimated to be 70 percent, based on two automotive manufacturing plants and seven aircraft hangars.[3] The commercial furniture industry is estimated to obtain a 20 percent reduction in emissions by using controls on dip tanks.[3]

TABLE 14. ESTIMATED METHYLENE CHLORIDE EMISSIONS FROM LARGE-SCALE MILITARY USERS OF PAINT STRIPPER, 1987

		Methylene Chloride Emissions (Mg/yr)			
Installation Name	City, State	Process Vents	Building Vents	Outdoor Sources	Total
Anniston Army Depot[a]	Anniston, AL	0	14	0	14
Bergstrom Air Force Base	Austin, TX	0	107	0	107
Corpus Christi Army Depot[a]	Corpus Christi, TX	0	45	0	45
Hill Air Force Base	Ogden, UT	0	186	0	186
Kelly Air Force Base	San Antonio, TX	0	247	0	247
Letterkenny Army Depot	Letterkenny, PA	0	4.8	0	4.8
McClellan Air Force Base	Sacramento, CA	0	188	0	188
Naval Aviation Depot[a]	Cherry Point, NC	0	14	0	14
Naval Aviation Depot	Jacksonville, FL	0	68	0	68
Naval Aviation Depot	Pensacola, FL	0	64	0	64
Naval Shipyard[a]	Philadelphia, PA	0	4.7	0	4.7
Robins Air Force Base[a]	Warner Robins, GA	0	247	0	247
Tinker Air Force Base[a]	Oklahoma City, OK	0	256	0.2	256
Tooele Army Depot	Tooele, UT	0	2.8	0	2.8
Wright-Patterson Air Force Base	Dayton, OH	0	1.6	0	1.6
Model Plant[b]		0	550	0	550
TOTAL[c]		0	6,400	0.2	6,400

Source: Reference 3.

[a] Detailed information available for this facility based on questionnaire response or site visit.

[b] The model represents each of the nine Naval installations not listed individually in this table, that are large-scale users of MC-based paint stripper, but for which MC consumption data are unavailable.

[c] The total emission estimates represent emissions from all 24 military users of MC for large-scale paint stripping operations.

TABLE 15. PAINT STRIPPING EMISSIONS FACTORS

Paint Stripping Application	Emission Factor[a]
Automobile facilities	0.8
Aircraft maintenance	0.8
Military installation dip tanks	0.4
Household uses	1.0

[a] Units are Mg emitted/Mg consumed in paint stripper.

TABLE 16. ADDITIONAL CONTROL TECHNIQUES FOR EMISSIONS OF METHYLENE CHLORIDE SOLVENTS FROM PAINT STRIPPER USERS

Emission Source	Additional Controls	Control Efficiency (%)
Storage Tank	Refrigerated Condenser	95[a]
Stripping in Large, Open Areas	Enclosure and Carbon Adsorption	95[b]
Stripping of Paint Spray Booths	Carbon Adsorption	95[b]
Dip Tank	Water Cover and Increased Drain Time	60[c,d]
	Carbon Adsorber[e]	50[d]

[a] Reference 8.

[b] Reference 9.

[c] Percent reduction in MC emissions based on reduction efficiencies estimated for cold cleaners in the organic solvent cleaning source category.

[d] Reference 10.

[e] This control option only applies to one dip tank that is operated like an open-top vapor degreaser.

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PLASTICS MANUFACTURING

Methylene chloride is used in the manufacture of polycarbonate resin, triacetate fiber, and other plastics. The processes and MC emissions for production of these materials are discussed below.

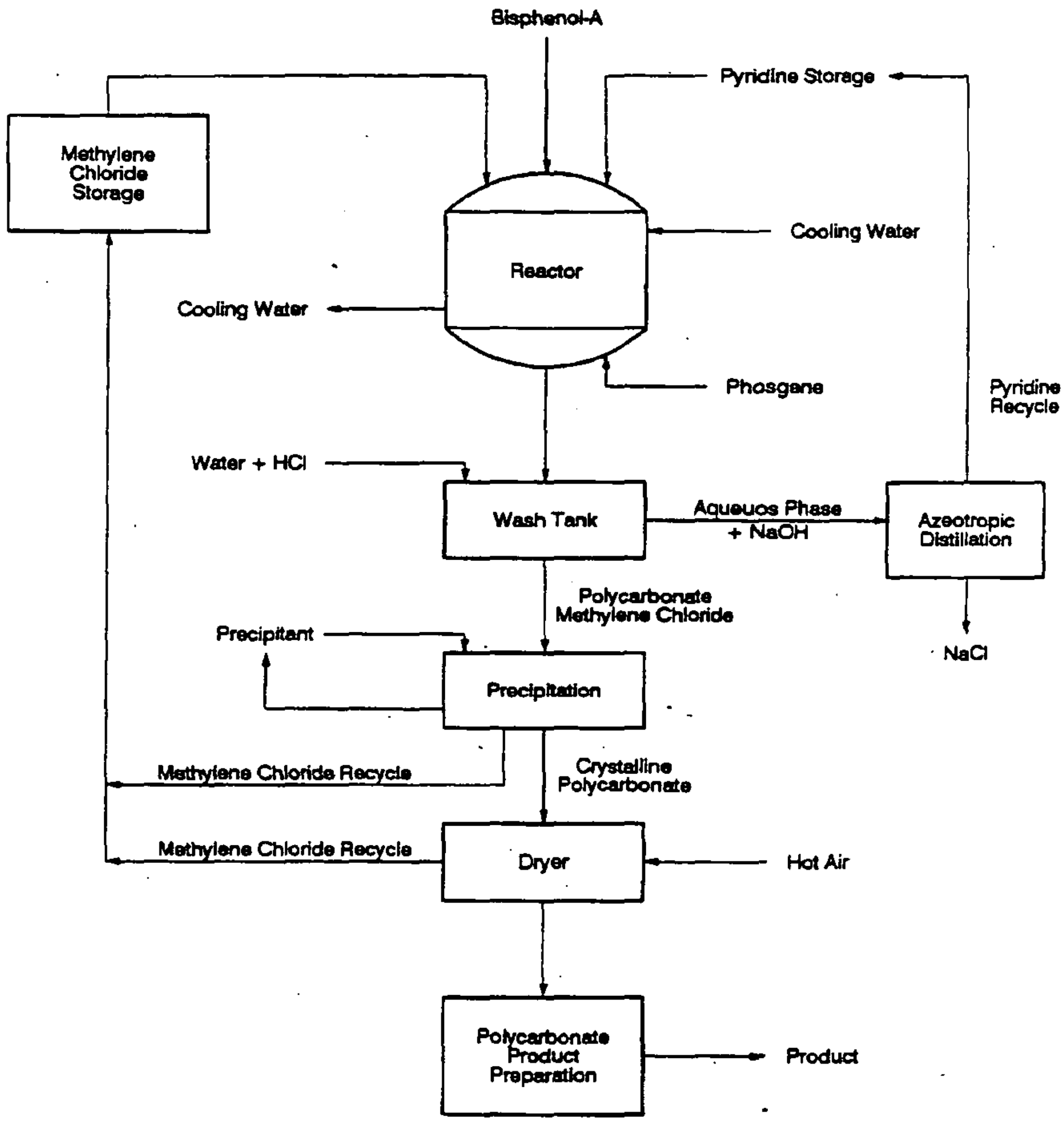
Polycarbonate Resins

Polycarbonates are a special class of polyesters derived from the reaction of carbonic acid derivatives with aromatic, aliphatic, or mixed diols. Polycarbonates are useful for their high impact strength, transparency, low flammability, and toughness. These qualities make them desirable for products that are subject to sudden loads, such as safety helmets, tool housings, appliances, and food dispensing equipment; and also for transparent items such as windows, automotive lenses, safety glasses, and bottles. Polycarbonates are used in greenhouses and for solar energy collection in commercial and residential applications. Medical devices are also made from polycarbonate because it can be sterilized both by autoclave and gamma radiation. Other uses for polycarbonate resins are in computers, aircraft, telephones, and business equipment.

Polycarbonate resins were manufactured by four producers in 1991: General Electric in Mount Vernon, Indiana; Bayer U.S.A. (Mobay Corporation) in Baytown, Texas; Dow Chemical in Freeport, Texas; and Mobay in New Martinsville, West Virginia.[1]

Process Description--

A process flow diagram for polycarbonate resin production is shown in Figure 4. Polycarbonates may be produced by the Schotten-Baumann reaction of phosgene with a diol in the presence of an appropriate HCl acceptor [e.g. bisphenol-A (BPA) with phosgene in the presence of an excess of pyridine], or by a melt transesterification reaction between the diol and a carbonate ester. Transesterification is reported to be the least expensive route; however, that process has been phased out because there were many polycarbonate products that could not be produced using transesterification.



Source: Reference 2

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Figure 4. Process flow diagram for the production of polycarbonate resin.

Generally, the interfacial process is used in the production of polycarbonate resins. During polymerization, a jacketed vessel equipped with an agitator is charged with the reactants and MC solvent. Phosgene gas is bubbled through the reactor contents. The reaction requires approximately 1-3 hours and is carried out at temperatures below 40°C (104°F). Pyridine and MC are recycled during the process.

The polymerized-liquified reactor contents are then pumped to wash tanks to remove residual pyridine using HCl and water. Methylene chloride is removed by steam stripping. The polycarbonate polymer is precipitated from the polymer-MC stream with an organic compound such as an aliphatic hydrocarbon and is separated by filtration. The filtered polymer is transferred to a dryer, while the solvent is recovered in a distillation column.

Both General Electric and Bayer now use the interfacial process described above. In this process, the BPA is dissolved as a disodium salt in aqueous caustic and reacted with phosgene bubbled into an MC layer. Reaction occurs at the solution's interface with the polymer "growing" into the MC layer. The MC layer is then separated, and the polymer is isolated by removal of solvent. At this stage, the various producers use a number of different processes, including devolatilization extrusion, granulation, and spray drying.

General Electric-PBG is the largest U.S. manufacturer of polycarbonate resin. At the GE BPA manufacturing plant, MC is a recrystallization solvent for BPA. Recrystallized BPA is dried and fed to the polycarbonate resin production process. Methylene chloride is captured and recycled back for reuse, at an overall recovery rate of 99.5 percent. Primary recovery means include low-temperature condensation and carbon adsorption with regeneration. General Electric is currently planning to make the BPA production process solventless by using a melting process instead of the MC recrystallization process to produce BPA.

At the General Electric polycarbonate resin plant, MC is also used as a process solvent to carry polycarbonate polymer through the reaction and purification process. The polycarbonate resin is then isolated and the MC is recovered through a distillation process and recycled. Numerous process vents are combined and routed to vent absorbers. The overall MC recovery rate in this operation is 99.8 percent.

At the General Electric polycarbonate-polysiloxane resin plant, which is small compared to the polycarbonate resin plant, MC is also used as a process solvent in the operation. At this operation, the overall MC recovery rate is approximately 93 percent.

As indicated above, the use of MC is a critical element in maintaining product quality and safety specifications. Also, other solvents may crystallize, craze, crack, or mar the surface of objects made from polycarbonates.[1]

Emissions*--

Emissions from polycarbonate resin production are from process vents, equipment leaks, storage, handling, equipment openings, and secondary sources. Information on estimated 1983 MC emissions from the Mount Vernon General Electric and Baytown Mobay facilities was obtained; however, more recent emissions data on these facilities could not be located, nor could emissions data for the Freeport Dow Chemical, or New Martinsville Mobay, plants. Emission sources, controls, control efficiencies, and emission quantities for the Mount Vernon General Electric and Baytown Mobay facilities in 1983 are presented in Table 17.

General Electric reported that the production of polycarbonate resins and proprietary associated processes at the Mt. Vernon facility resulted in 3,578 Mg of MC emissions in 1983. The company indicated that emissions reported for individual sources were either rough estimates or maximum allowable permitted levels and that it could not give exact values for each emission source. General Electric reported four process areas emitting MC. Two of the process areas used MC in polycarbonate synthesis; the other two

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* Information presented in this section on emissions from polycarbonate resin production was obtained from Reference 2.

TABLE 17. ESTIMATED 1983 EMISSIONS AND CONTROLS AT FACILITIES USING METHYLENE CHLORIDE IN POLYCARBONATE RESIN PRODUCTION

Company/ Location	Type of Emissions	Controls	Reported Control Efficiency (%)	MC Emissions (Mg/yr)	Comments
General Electric	Process				
Mount Vernon, IN	• Hopper Dryers	None	0	17.0	41 dryers
	• Hopper Dryers	None	0	18.6	45 dryers
	• Extruder Die Hoods	None	0	224.6	7 hoods
	• Extruder Die Hood	None	0	4.5	1 hood
	• Extruder Die Hood	None	0	2.5	1 hood
	• Extruder Die Hood	None	0	8.8	1 hood
	• Extruder Die Hood	None	0	13.4	1 hood
	• Extruder Die Hood	None	0	0.2	1 hood
	• Molding Machine Vents	None	0	4.8	2 vents
	• Q.A. Hood Vent	None	0	6.4	4 vents
	• Extruder Die Vents	None	0	391	17 vents
	• Extruder Vacuum Pump	None	0	86.4	6 pumps
	• Extruder/Die Vent	None	0	11.2	3 vents
	• Extruder/Die Vent	None	0	93.8	8 vents
	• Molding Machine	None	0	3.2	2 units
	• Vacuum Stripping Blowers	None	0	0.6	4 units
	• Vent Gas Absorber	Water Scrubber	87	477.3	1 vent
	• Vent Gas Absorber	Water Scrubber	87	477.3	1 vent
	• Carbon Adsorption System	Carbon Bed	87	46.2	
	• Filter Receiver	None	0	85.6	2 units
	• Filter Receiver	None	0	85.6	2 units
	• Weight Hopper Vent	None	0	0.6	2 units

TABLE 17. (CONTINUED)

Company/ Location	Type of Emissions	Controls	Reported Control Efficiency (%)	MC Emissions (Mg/yr)	Comments
GE, Mount Vernon	• Feed Hopper	None	0	0.3	1 unit
(Cont'd)	• Surge Hopper	None	0	7.6	2 units
	• MC Storage Tank	Conservation Vent	10	17.6	
	• Storage Silo	None	0	170	
	• Solvent Recovery	Carbon Bed	87	347	
	• MC Dryer System	Knock Out Pot/ Demister	50	79.6	
	• Tar/Isomer Storage	None	0	0.4	
	Equipment Leaks				
	• Building 14/16	Photo ionization detection system	0	175	Monitors 40 points
	• Building 15/31	Photo ionization detection system	0	71.8	Monitors 10 points
	Storage				
	• 44 process and storage vessels	Vent gas absorbers	87	0.1	Bldg 14/16
	• Pressure vessel	Conservation vent	10	1.5	Bldg 15/31
	Equipment Opening	None	0	63.7	
	Secondary				
	• Biological Treatment	None	0	584	
TOTAL				3,578	
Mobay Chemicals,	Process				
Baytown, TX	• Vent	Scrubber	98	0.3	
	• Reactor Vent	None	0	0.07	
	• Reactor Vent	None	0	0.05	

TABLE 17. (CONTINUED)

Company/ Location	Type of Emissions	Controls	Reported Control Efficiency (%)	MC Emissions (Mg/yr)	Comments
Mobay Chemicals (Cont'd)	Equipment Leaks	Monthly portable gas chromatograph check, pressure relief device controls	NR	51.2	
	Equipment opening	None	0	16.5	Primarily sampling openings
	Storage				
	• Fixed-Roof Tank	Vent to scrubber	98	0.006	27,100 gallons
	• Fixed-Roof Tank	Vent to scrubber	98	0.006	150,000 gallons
	• Fixed-Roof Tank	Vent to scrubber	98	0.1	85,200 gallons
	• Fixed-Roof Tank	Vent to scrubber	98	0.1	85,200 gallons
	• Fixed-Roof Tank	Vent to scrubber	98	0.003	27,100 gallons
	Secondary				
	• Wastewater stream	Biological & Carbon Treatment	NR	22.0	
	• Contained solvent	Incineration	NR	0	
	• Process water trench	Biological & Carbon Treatment	80	11.0	
	• Leaks and spills	None	0	41.4	
	Handling				
	• Railcar, tank truck	None	0	0.6	
TOTAL				**143**	

Source: Reference 2.

areas were used in polycarbonate processing, and MC emissions resulted from residual in materials processed.

Process vents were the source of 75 percent of the total MC emissions for this plant. Many of the smaller vents were uncontrolled, but some of the larger vents were controlled by scrubbers or carbon adsorbers, achieving 87 percent control.

The second largest MC emission source at General Electric was secondary sources (16 percent). General Electric estimated that approximately 1,818 kg/day MC was discharged to the site sewer system. Approximately 218 kg/day reached the wastewater treatment plant for on-site biological treatment. The remaining 1,600 kg/day were lost to the atmosphere in three areas: (1) the brine recovery operation, (2) the sewer system, and (3) the wastewater treatment plant prior to biological treatment. As discussed in Section 4, emissions from wastewater prior to treatment can be reduced by using covers and enclosures, either alone or with a closed-vent system and control device.

Equipment leaks were the third largest source of emissions (7 percent) generated at the General Electric plant. Equipment counts were reported for two of four process areas; the other two process areas did not have equipment in MC service, and emissions resulted from residual MC in the materials processed. General Electric reported that multipoint programmable sequence area monitoring was performed to detect MC leaks using a photo ionization detection HNμ system. However, because it did not report the frequency of repair, uncontrolled emission factors were used to estimate equipment leak emissions, possibly resulting in an overestimate. Leak detection and repair programs can reduce emissions from equipment leaks.

General Electric based the equipment openings emissions estimate on field estimates of quantities in the system at the time of opening. Emissions were extrapolated using the number of occurrences and assuming 100 percent loss.

The polycarbonate resin process generated 143 Mg of MC emissions at Mobay Chemical in Baytown, Texas, in 1983. Table 17 documents emission sources, controls, control efficiencies, and 1983 emission amounts for this facility.

Secondary sources were the largest source of MC emitters at 74.4 Mg/yr. Mobay listed three sources for these emissions: (1) a wastewater stream going to biological and carbon treatment (22.1 Mg); (2) a process water trench also going to biological and carbon treatment (10.9 Mg); and (3) other leaks and losses prior to maintenance work (41.4 Mg).

Emissions from equipment leaks were 51.2 Mg in 1983. Mobay had 33 pressure relief devices protected by rupture disks. Twenty more relief valves were vented to a scrubber to control emissions, and five pressure relief valves were unprotected.

Mobay's recorded process variables each shift to detect obvious leaks. Also, a daily walkthrough was performed to spot leaks. A solvent inventory was taken each week to account for any unusual loss. All pump seals and vent locations were checked monthly with a portable gas chromatograph. In addition, one technician devoted half-time to solvent loss prevention. Mobay believed this monitoring system was reasonably effective for obvious losses. Mobay did not report the frequency of leak repairs, and emissions from equipment leaks were calculated using uncontrolled emission factors. Therefore, these emissions may be overstated.

Losses from equipment openings were 16.5 Mg in 1983. Forty-four percent of equipment openings losses were due to daily sampling. Mobay reported that approximately 50 samples are taken per day. Filter replacement contributed about 37 percent of MC emissions. Replacement of an 80,000-gallon product tank emitted 1.6 Mg. Other equipment opening losses were due to routine maintenance of purification equipment, pump seal replacement, heat exchanger replacement, and from opening open solvent lines to remove pluggage.

Solvent handling losses were 0.6 Mg/yr. Methylene chloride was delivered by railcar and/or tank truck. No control equipment was used to reduce emissions during unloading.

Emissions from three process vents totalled 0.4 Mg in 1983. A process vent scrubber operating at 98 percent MC removal efficiency emitted 0.3 Mg MC. The emission level was determined from inlet and outlet sampling and gas chromatograph analysis of the samples for composition. Two reactor vents that emitted MC only when the reactor was being filled had a combined annual loss rate of about 0.1 Mg/yr. Emissions occurred from these vents for only about 10 minutes per month.

Losses from five fixed-roof storage tanks were about 0.2 Mg in 1983. All storage tank conservation vents were vented to a scrubber. Mobay reported that sampling indicated that this control technique reduced emissions by 98 percent.

Information on the amount of MC used or the amount of polycarbonate resin produced at the Mobay and General Electric facilities was not available to allow development of emission factors per unit of MC used or per unit of product produced. However, as discussed in depth under MC production, storage and handling emission factors can be derived by using information on the types of storage tanks and transfer equipment found at a specific site to select the appropriate factors for that site from EPA Publication No. AP-42. Also as described in Section 4.0, the methodologies presented in "Protocols for Generating Unit-Specific Emission Estimates for Equipment Leaks of VOC and VHAP" (volatile hazardous air pollutant) can be used to estimate emissions from equipment leaks. An example of one of the simpler methodologies is presented in Appendix A, Section 2. Emissions of MC from wastewater can be estimated using site-specific data with the methodology presented in the EPA CTC document on VOC emissions from industrial wastewater.

Triacetate Fiber

Methylene chloride is used by one company, Celanese Corp., in Cumberland, Maryland, as a solvent for spinning cellulose triacetate fibers. It is estimated that all of the approximately 2.0 Mg of MC used at this facility are released to the air. Methylene chloride, which is an excellent and inexpensive solvent for the production of secondary acetate, has been used for triacetate production since 1930. Nearly all of the cellulose triacetate is used for ladies' apparel.

Much of it is used to make 100 percent continuous-filament open fabric. High bulk Tricel is used in knitwear.[1]

Process Description--

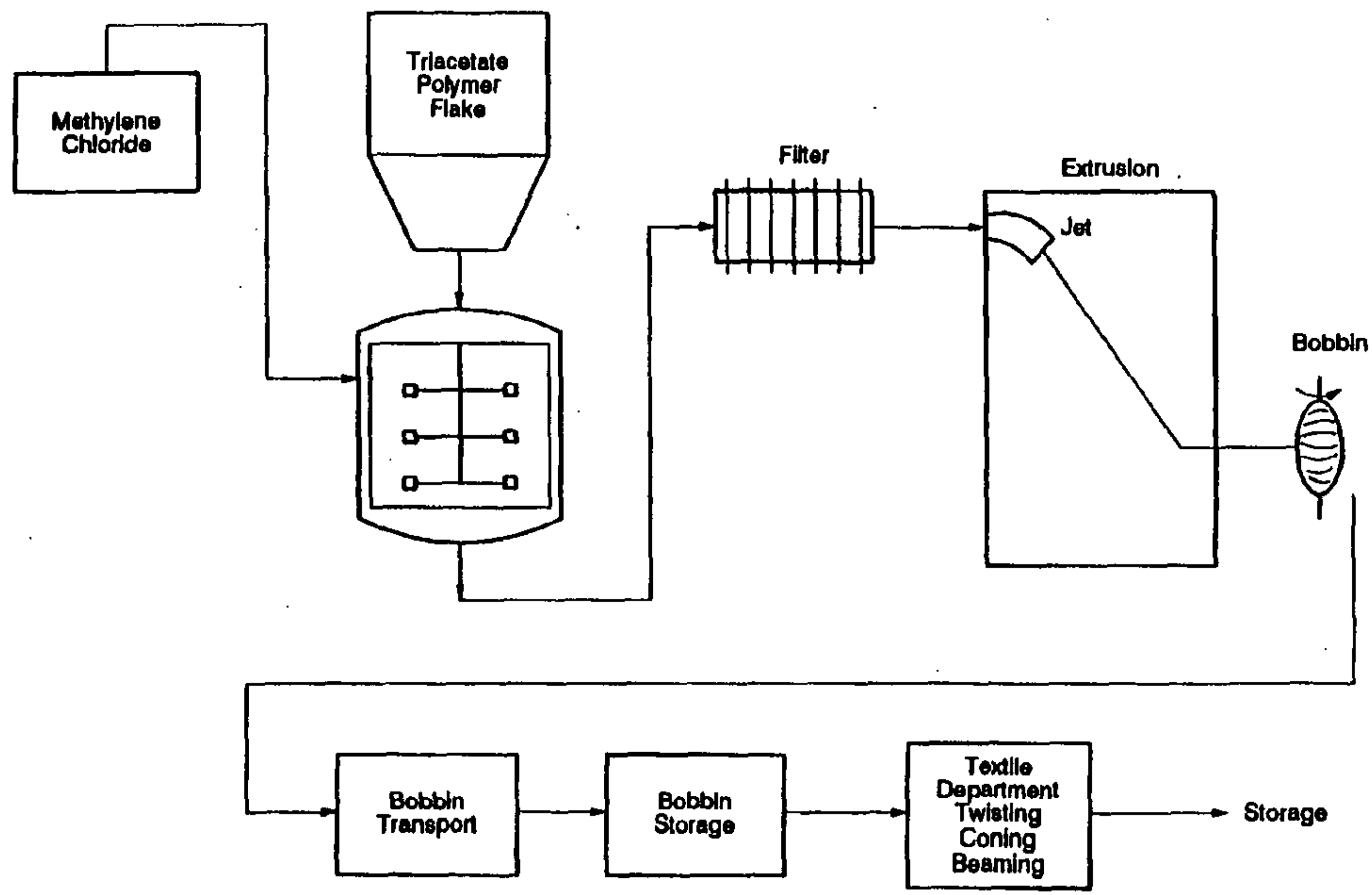
No information was located on the triacetate fiber manufacturing process used at Celanese's Cumberland, Maryland, facility. However, a 1985 process description was obtained for its Rock Hill, South Carolina, plant, which is no longer producing triacetate fiber.

A solution of MC and methanol is fed into a batch mixer containing triacetate polymer flakes and other dry ingredients. The solvents are slowly mixed with the solids until the solids are completely dissolved, forming the liquid polymer dope. The dope is then filtered and pumped to the extrusion area, where it is preheated, and then extruded and dried. The dried fibers are spun onto bobbins until further processing is performed, which may include twisting, coning, and beaming.[2] A process flow diagram is shown in Figure 5.

Solvents that can be substituted for MC in the manufacture of cellulose triacetate are chloroform, formic acid, glacial acetic acid, dioxan and cresol.[1]

Emissions--

No information was located on emissions of MC from triacetate fiber manufacture at the Celanese Cumberland, Maryland, plant. Estimated emissions from the Rock Hill, South Carolina, plant in 1983 are given in Table 18. It is not known whether this information is representative of the current MC emissions, sources, and controls at the Cumberland, Maryland, plant. Because of lack of information, emission factors could not be developed for this process. As discussed in depth in Section 4, EPA methods from the AP-42 and "Protocols" documents can be used with site-specific data to develop emissions estimates for storage, transfer, and equipment leak emissions from triacetate fiber production.



Source: Reference 2

Figure 5. Process flow diagram for the production of triacetate fibers.

TABLE 18. ESTIMATED METHYLENE CHLORIDE EMISSIONS AND CONTROLS ASSOCIATED WITH TRIACETATE FIBER MANUFACTURE[a]

Types of Emissions	Controls	Reported Control Efficiency (%)	MC Emissions (Mg/yr)	Comments
Process • Solvent recovery	Carbon adsorption	98[b]	5,150	
Equipment leaks	Infrared gas analyzers	0	22.0	
Transfer • Tank truck, tank car	Vent to solvent recovery	NR	0.5	
Relief devices	NA		2.7	Mixture rupture discharge

[a] Emissions data apply to a Celanese chemical plant in Rock Hill, S.C. in 1983. Data taken from Reference 2.

[b] Greater than 98 percent efficiency reported, but only 98 percent is accepted without supporting test data.

Plastics Production

In 1983, the General Electric facility in Pittsfield, Massachusetts, was reported as using MC in a plastics production operation.[2] Current data verifying the continued use of MC at this plant could not be located, nor could data on the use of MC for plastics production at other facilities.

Process Description--

At the time the 1983 information was gathered on plastics production at its Pittsfield, Massachusetts, plant, General Electric considered information on process description and end products confidential.[2] Because non-confidential information from other plants was not located, descriptions of processes using MC in plastics production are not available.

Emissions*--

Process vents and equipment leaks were the major emission sources at the General Electric facility. It also reported emissions from secondary sources, storage tanks, and equipment openings. Transfer emissions were unknown at that point because the facility had just instituted a new bulk handling system for pumping solvent from tank trucks into on-site storage tanks. Emission sources, controls, control efficiencies, and emission levels for 1983 are presented in Table 19.

Total MC emissions at this facility were 74.0 Mg in 1983. Emissions from process vents were 64.9 Mg of MC (88 percent of total MC emissions). General Electric reported 13 process vents, with three vents controlled by condensers. A precipitation condenser vent and a dryer vacuum pump were both controlled by condensers operating at 50 percent MC removal efficiency. Emissions from these vents after control were 27.2 Mg and 9.8 Mg, respectively. The precipitation condenser vent was the largest single MC emission point at the facility. An MC still vent was controlled by a condenser operating at 97 percent removal efficiency. Emissions from this vent were 8.2 Mg.

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* Information presented in this section on emissions from plastics production was obtained from Reference 2.

TABLE 19. ESTIMATED METHYLENE CHLORIDE EMISSIONS AND CONTROLS ASSOCIATED WITH PLASTICS PRODUCTION AT GENERAL ELECTRIC, PITTSFIELD, MASSACHUSETTS IN 1983

Types of Emissions	Controls	Reported Control Efficiency (%)	MC Emissions (Mg/yr)	Comments
Process				
• Reactor vent	None	0	4.6	
• Phosgenation reactor	None	0	2.4	
• Precip. room vent	None	0	1.8	
• Work-up room vent	None		1.3	
• Stripper room vent	None	0	1.8	
• Stripper room vent	None	0	1.8	
• Precip. condenser vent	Condenser	50	27.2	
• MC still water tank	None	0	0.9	
• Area vent	None	0	2.7	
• MC still vent	Condenser	97	8.2	
• MC/water separator	None	0	1.8	
• Still decant tank	None	0	0.5	
• Dryer vacuum pump	Condenser	50	9.8	
Equipment leaks	None	0	6.1	Leaks detected by observation and weekly mass balance
Storage				
• Fixed-roof tank	To Condenser	50	0.09	4,100 gallons
• Fixed-roof tank	None	0	0.06	500 gallons
• Fixed-roof tank	None	0	0.06	500 gallons
• Fixed-roof tank	To Condenser	50	0.007	1,500 gallons
• Fixed-roof tank	To Condenser	50	0.1	1,250 gallons
• Fixed-roof tank	None	0	0.005	250 gallons
Equipment Opening	None	0	2.3	
Secondary				
• Aqueous waste stream	To Sewage Treatment	80	0.1	
• Drums	To Haz. Waste Disposal	90[a]	0.01	

[a] Greater than 98 percent efficiency reported, but only 98 percent is accepted without supporting test data.

Source: Reference 2.

The 10 remaining process vents were uncontrolled. Emissions ranged from 4.6 Mg for reactor area ventilation to 0.9 Mg for the MC still-water tank.

Equipment leaks resulted in MC emissions of 6.1 Mg/yr. Valves emitted approximately 3.1 Mg of MC (51 percent). Pump seals and flanges emitted 1.0 Mg (16 percent) and 0.8 Mg (13 percent), respectively. General Electric reported that there was no automated leak detection system for MC. Any significant MC leaks were generally determined by operator observation. Also, a weekly mass balance inventory was maintained for MC usage. Substantial increases over the normal process usage requirements initiated a full system investigation to determine if any leakage was occurring.

Equipment opening losses were approximately 2.3 Mg in 1983. General Electric estimated this loss for approximately 2,000 openings, 1,300 of which were an end-cap reactor nozzle opened during each batch to add reactants. In addition, another reactor nozzle is opened 650 times per year. Other equipment openings involved work-up tanks, Westfalia centrifuges, filter feed tanks, filters, MC stills, and separator/decant tank. General Electric provided an overall equipment opening loss estimate, but did not identify emissions by specific sources.

General Electric maintained six fixed-roof storage tanks containing MC. The emissions from these tanks totalled 0.3 Mg/yr. The tanks ranged in volume from 250 to 4,100 gallons. Three of the tanks were vented to a vent condenser with 50 percent control efficiency. Emissions from two other tanks were piped to a controlled tank, while one tank was uncontrolled.

A bulk handling system for MC was instituted in 1983. Tank truck deliveries were made to a fixed-roof, 4,100-gallon storage tank. The tank car feed line was connected to a pump at the storage tank base and delivered into the storage tank. Vapors were piped to the plant vent system, which condensed most of the MC vapors. General Electric reported air intake was through a canister and a vacuum relief valve.

Two waste streams emitted about 0.2 Mg of MC in 1983. The major secondary emission source was a liquid stream to the sewage treatment plant, which emitted 0.15 Mg of MC. A second waste stream was unidentified. This stream is contained in drums that were sent to a licensed hazardous waste disposal company. Emissions (0.01 Mg) occurred when the waste stream was transferred to drums.

Because of the lack of information about the actual production process, emission factors on a per-MC-used or per-product-produced basis could not be developed. As described in Section 4.0 on production, the methodologies presented in "Protocols for Generating Unit-Specific Emission estimates for Equipment Leaks of VOC and VHAP" (volatile hazardous air pollutant) can be used to estimate emissions from equipment leaks. An example of one of the simpler methodologies is presented in Appendix A. Storage and handling emission factors can be derived by using site-specific information on the types of storage tanks and transfer equipment to select the appropriate factors from EPA Publication No. AP-42.

REFERENCES FOR PLASTICS MANUFACTURING

1. Occupational Safety and Health Administration Proposal for New Methylene Chloride Standard, 56 FR 57047, November 7, 1991.

2. Survey of Methylene Chloride Emission Sources, EPA-450/3-85-015, U.S. Environmental Protection Agency, Research Triangle Park, NC, June 1985.

FLEXIBLE URETHANE FOAM PRODUCTION INDUSTRY

Polyurethane products are generally complex plastics that form from a reaction of liquid isocyanate components with liquid polyol resins.[1] The resin component can also contain blowing agents, combustion retarding agents, and catalysts. Polyurethane products include polyurethane foams, flexible polyurethane foams, and polyurethane elastoplastics.[1] Polyurethane foams are solid.

Methylene chloride is the leading auxiliary foam-blowing agent used in the production of flexible urethane foams. Its use in the foam industry is largely in the production of flexible slabstock foam.[2] It also has some use in the production of flexible molded foam.[3] The development of new catalysts enabled the use of MC in a variety of foam formulations.

Methylene chloride is considered to be a physical blowing agent (also known as "solvent") that assists in foam cell formulation, as it is a low boiling point (39.8°C) halogenated hydrocarbon that does not decompose.[3,4] There are indications that MC is also used to clean the molding and the foam mixing head, and as a carrier solvent for the mold release agent.[3]

There are an estimated 180 foam-blowing companies in the United States, including slabstock and flexible molded foam companies.[1] In 1991, these companies consumed approximately 14 percent of the total MC production.[2] Polyurethane foam industry consumption of MC in 1984 was estimated to be 70 percent slabstock urethane foam and 30 percent flexible molded foam, derived from Halogenated Solvents Industrial Alliance (HSIA) data and Section 114 questionnaires.[3] The 1991 estimate shows a 20 percent increase in use in polyurethane foam production from the 1984 estimate. Flexible urethane molded foam facilities were not located at that time because this product was considered to be a less significant source of MC emissions. The present location of all existing foam-blowing facilities was not determined. The following sections will discuss the industry production processes, emission sources, and emission estimates of MC from flexible urethane foam production.

Process Description

In order to produce a foam, it is necessary to generate nucleating bubbles within a gelling mixture. Polyurethane elastoplastics are produced using either polyether polyols or polyester and diisocyanates (combustion-retarding agents may also be employed). These foams are available in pourable or injectable liquid, preformed pelletized solids, and sheetstock. Flexible foams are produced from polyether polyols, toluene diisocyanate (TDI), and polymeric isocyanates.[1] These foams are generally low-density, soft foams that incorporate carbon dioxide gas as the primary blowing agent.[1] In the production of rigid polyurethane foam (made from polyether polyols, combustion-retarding agents, polymeric isocyanates, and low-boiling halocarbon blowing agents), MC is not used as a blowing agent, but is often employed for filling and cleaning the mixing head.

As mentioned previously, polyurethane foam production (especially slabstock urethane foam) is the primary MC consumption source within polyurethane foam-blowing production, and will be the focus of the discussion in the following text.

Flexible polyurethane foam slabstock and flexible molded foam are produced by the exothermic reaction of TDI with a polyol. As mentioned, carbon dioxide is the primary blowing agent, with MC being used as an auxiliary blowing agent. Production involves the mixing of TDI and polyol directly with the blowing agents, catalysts (i.e., tertiary amines), foam stabilizers, and flame retardants.

The foam-producing reaction occurs within the "foam tunnel" of the process production line. These foam tunnels are generally conveyorized in-line systems enclosed on the sides by plastic curtains. Chemical ingredients are normally pumped from tanks or 55-gallon drums to a mixing head and discharge nozzle.[3] The nozzle pumps the liquid reactants onto the conveyor belt within the tunnel. An exothermic reaction of the chemicals produces the primary blowing agent (e.g., carbon dioxide), which results from the reaction of isocyanate with water, and vaporizes the secondary blowing agent (e.g., MC), producing the foam cells during its formation. The heat evolved from the reaction of the isocyanate with the polyol and with water is more than sufficient to boil or evaporate MC.

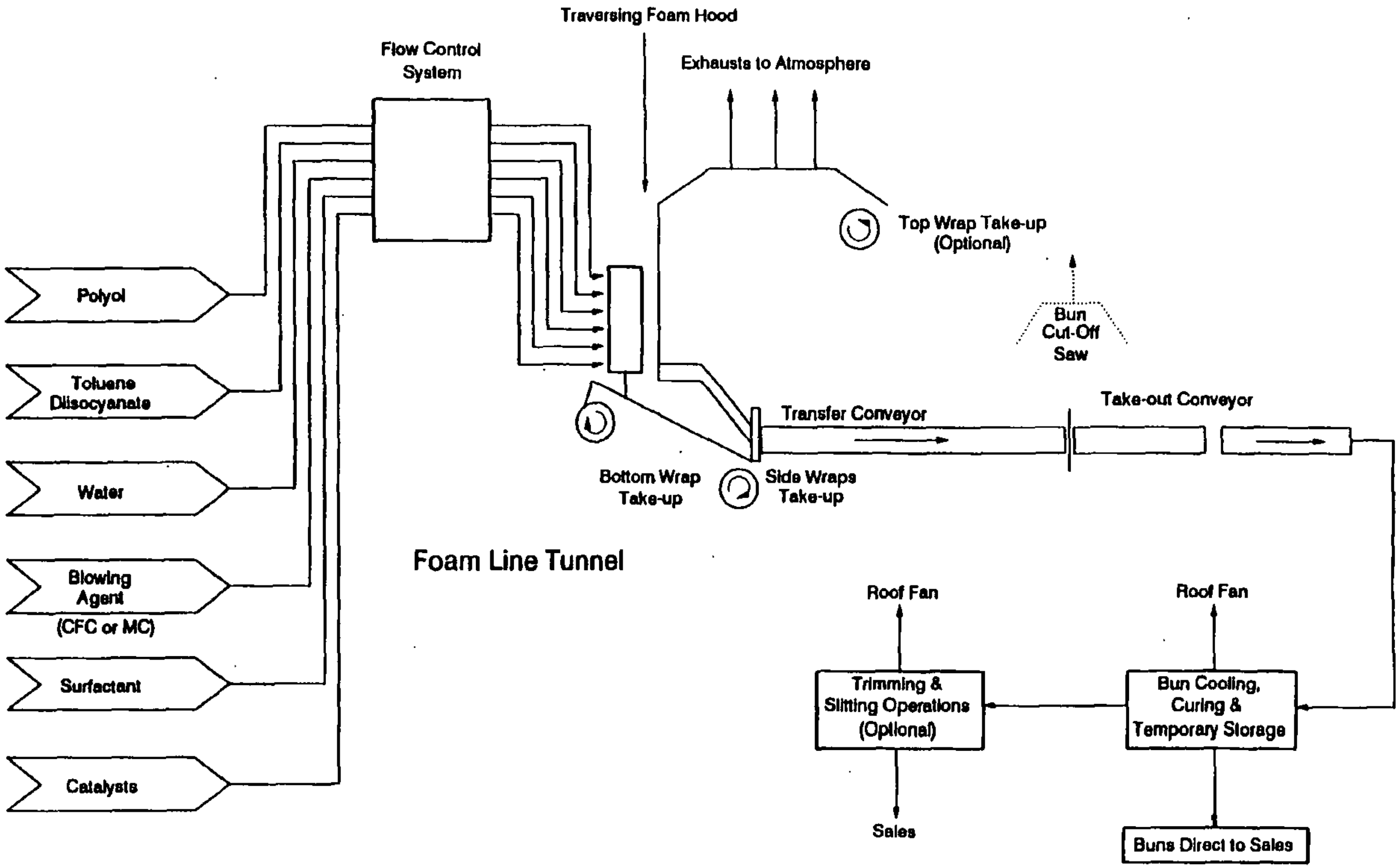
Foam slabs at varying dimensions reach their maximum height within 4 minutes after the chemical liquid reactants are discharged onto the conveyor. When this process involves the reaction mix being poured into a closed mold, it produces a flexible polyurethane molded foam.[1] When such molds are not used, slabstock results. Polymerization (e.g., gelling) reactions and further solidifying of the foam occurs prior to the foam exiting the tunnel (an estimated 10 minutes). Following exit from the tunnel, the foam is further cooled, prepared (e.g., sawed into slabs) and packaged.[3]

One of the most important processing parameters is temperature. Temperature changes can affect the viscosity of the mixture, which influences the pump's metering ability. Pumps are metered to enable proper mixture composition, and differ according to whether high or low pressure machines are used, or whether the process is done on a batch or continuous basis.[1] Figure 6 is a typical schematic flow diagram of flexible polyurethane slabstock foam production that illustrates the foam line tunnel conveyor and product preparation steps.[3]

Emission Sources and Controls

The primary MC emission sources from polyurethane foam production facilities include process vents, equipment leaks, and storage tanks.

Process vent emissions are primarily from vents above the foam tunnel and in the foam curing area. Data obtained from a foam manufacturer in 1986 included mass balance data that indicated that approximately 60 percent of the initial MC charge is emitted in the tunnel and approximately 40 percent is emitted in the curing area.[3] Section 114 questionnaire responses from foam manufacturers reporting the use of MC as an auxiliary blowing agent indicated that control devices were not being used to reduce process vent emissions.[3] Industry still reports that process vent controls are not employed because of the expense; however, technological research on process vent controls is underway.[5] Industry also reports significant research on process modifications to eliminate the use of MC in polyurethane



Source: Reference 3.

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Figure 6. Schematic flow diagram of polyurethane flexible foam production.

foam production.[5] An emission factor for uncontrolled process vents (foam tunnel, curing area) in the polyurethane foam (flexible slabstock) production is presented in Table 20.[6] This emission factor was derived on the assumption that MC consumption by the industry equals process vent emissions, plus equipment leak and storage emissions.[3]

Equipment leaks in polyurethane flexible foam production process occur when the liquid or gas process stream leaks from components. The following types of process components are used in foam production: pumps, flanges, liquid valves, gas pressure relief devices, sampling connections, and open-ended lines. As with MC production, the methodologies outlined in the document, "Protocols for Generating Unit-Specific Emission Estimates for Equipment Leaks of VOC and VHAP," can be used to estimate emissions from the production process equipment leaks.[7] An example of one of the simpler methods is presented in Appendix A. An emission factor for uncontrolled MC equipment leaks based on Section 114 questionnaire responses in 1985 is presented in Table 20.[6]

Storage tank emissions can be derived by using EPA Publication No. AP-42 factors with site-specific information.[8] An example calculation is presented in Appendix A. Accidental spills and resulting emissions are considered to be minimal. An estimated storage tank emission factor derived for uncontrolled storage tanks (including fixed-roof tanks and pressurized tanks) using average storage tank data from Section 114 questionnaire responses in 1985 is presented in Table 20.[6] Facilities that have pressurized tanks were assumed to have no emissions.

An aggregate emission factor for the entire production process is also presented in Table 20,[6] and is based on the assumption that all the MC consumed during the process is emitted to the air at some point in the process.

Emissions Control--

Potential control techniques to reduce MC emissions from polyurethane flexible foam production processes, and their estimated control efficiencies are presented in Table 21.[3]

TABLE 20. UNCONTROLLED EMISSION FACTORS FOR POLYURETHANE FOAM PRODUCTION

Emission Source	Emission Factor g/kg (lb/ton) MC Consumed
Process vents (foam tunnel, curing area)	980 (1960)
Equipment leak emissions	17 (34)
Storage tank emission	3 (6)
Entire Process	1000 (2000)

Source: Reference 6.

TABLE 21. CONTROL TECHNIQUES AND EFFICIENCIES USED TO ESTIMATE CONTROLLED EMISSIONS FROM POLYURETHANE FLEXIBLE FOAM PRODUCTION

Emission Source	Control Technique	Percent Reduction in Methylene Chloride Emissions
Process Vents:		
Foam Tunnel	Foam Tunnel Enclosure/ Carbon Adsorption	95[a]
Curing Area	None	0
Storage Tanks	Condenser	85
Equipment Leaks		60-100[b]
Pump Seals		
Packed	Monthly LDAR	60.8
Mechanical	Monthly LDAR	60.8
Valves		
Gas	Monthly LDAR	73
Liquid	Monthly LDAR	59
Pressure Relief Devices		
Gas	Rupture Disk	100
Sample Connections	Closed Purge Sampling	100
Open-Ended Lines	Caps on Open Ends	100

Source: Reference 3.

[a] Assumes 100 percent capture efficiency within foam tunnel.

[b] Depends on control technique for given equipment component.

LDAR = Leak Detection and Repair

As previously discussed, not all production facilities have been located and contacted recently to discern whether controls are more stringent now than in 1985. It is known, however, that MC use within this industry has increased by 20 percent since 1984 as it has increasingly been used as a substitute for CFC-11 in the production process.

REFERENCES FOR POLYURETHANE FOAM INDUSTRY

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PHARMACEUTICAL MANUFACTURING

The pharmaceutical manufacturing industry used approximately 11 percent of the total MC consumed in the United States in 1991.[1] Methylene chloride is used in pharmaceutical manufacturing as a general solvent, as an extraction solvent, and in tablet coatings.[2,3] Although most of the MC is used in pill coatings, it is also used in the manufacture of antibiotics, vitamins, contraceptives, and drugs used to control hypertension and diabetes. Many facilities have been able to reduce or eliminate MC from tablet coating operations and substitute water or other safer chemicals. Previous EPA studies indicate that there are over 800 pharmaceutical plants in the United States and its territories,[2] but MC is used in only 76 of these facilities.[4] Table 22 contains a partial list of pharmaceutical manufacturing facilities that use MC. It should be noted, however, that the information is based on a 1985 survey.[3] A survey of 1989 TRIS data revealed 74 pharmaceutical facilities using MC. Refer to Appendix D for a list of these facilities. Ten of the facilities on the TRIS list are found in Table 22.

Methylene chloride is useful in pharmaceutical extractions for a number of reasons. Because of its low boiling point (40°C), it can be used to extract heat-sensitive materials. It is useful in extractions from water because it is immiscible with water, tends not to emulsify, and has a high specific gravity (1.33 at 20°C).[5,6] Some pharmaceutical companies use MC as an extraction solvent because their product is very soluble in MC.[5]

The main reason that MC is used to spray coating on tablets is that it is highly volatile and so evaporates readily. Methylene chloride is also useful if the tablet is sensitive to water and/or heat.[7] Methylene chloride forms a binary azeotrope with water (98.5% by weight at 38°C) and can be used as a drying medium.[5,6] This azeotropic property can be important for coating crystals with another water-soluble solid. A typical coating solution does not consist of just MC, but is also composed of lesser percentages of alcohol and solids. Methylene chloride is completely miscible with other chlorinated solvents, diethyl ether, and ethanol, so the above mixture can be varied to give the best coating.[5,7] Some companies use MC

TABLE 22. PARTIAL LIST OF PHARMACEUTICAL MANUFACTURING FACILITIES THAT USE METHYLENE CHLORIDE

Facility	Location	Annual Capacity kg/yr (lb/yr)
Abbott Labs[a]	Barceloneta, PR North Chicago, IL	[b]
Aldrich Chemical	Milwaukee, WI	[b]
Beecham, Inc.[a]	Piscataway, NJ	[b]
Biocraft Labs[a]	Waldwick, NJ	2,300,000 (5,000,000)
Bristol-Myers[a]	Syracuse, NY	[b]
Burroughs Wellcome[a]	Greenville, NC	[b]
Chemical Dynamics	S. Plainfield, NJ	270 (600)
Chemical Service	West Chester, PA	45 (100)
Ciba Geigy[a]	Ardsley, NY Summit, NJ	[b] [b]
Deepwater, Inc.	Compton, CA	45 (100)
Eli Lilly & Co.[a]	Indianapolis, IN	[b]
Frank Enterprises	Columbus, OH	[b]
Ganes Chemicals, Inc.	Pennsville, NJ	[b]
Genzyme	Boston, MA	[b]
Henkel of America	Kankakee, IL	[b]
Nepera, Inc.	Harriman, NY	[b]
Pfizer[a]	Groton, CT Terre Haute, IN	[b]
Squibb Corp.[a]	Kenly, NC	10,000 (22,000)
Upjohn[a] (Fine Chemical Div)	Arecibo, PR Kalamazoo, MI	[b]
Warner Lambert	Holland, MI	[b]
William H. Rorer	Fort Washington, PA	[b]

Source: Reference 3.

[a]Also found in TRIS data.

[b]Capacity not available.

NOTE: These operating plants and locations were current as of November 1985. The reader should verify the existence of particular facilities by consulting current listings and/or the plants themselves. The level of MC emissions from any given facility is a function of variables such as capacity, throughput, and control measures, and should be determined through direct contact with plant personnel.

because it dissolves cellulose acetate, which can be used for semi-permeable membranes.[5] Another reason for its prevalent use is that it is easy to control emissions through activated carbon absorption, and the MC retained can be reused without further purification.[7]

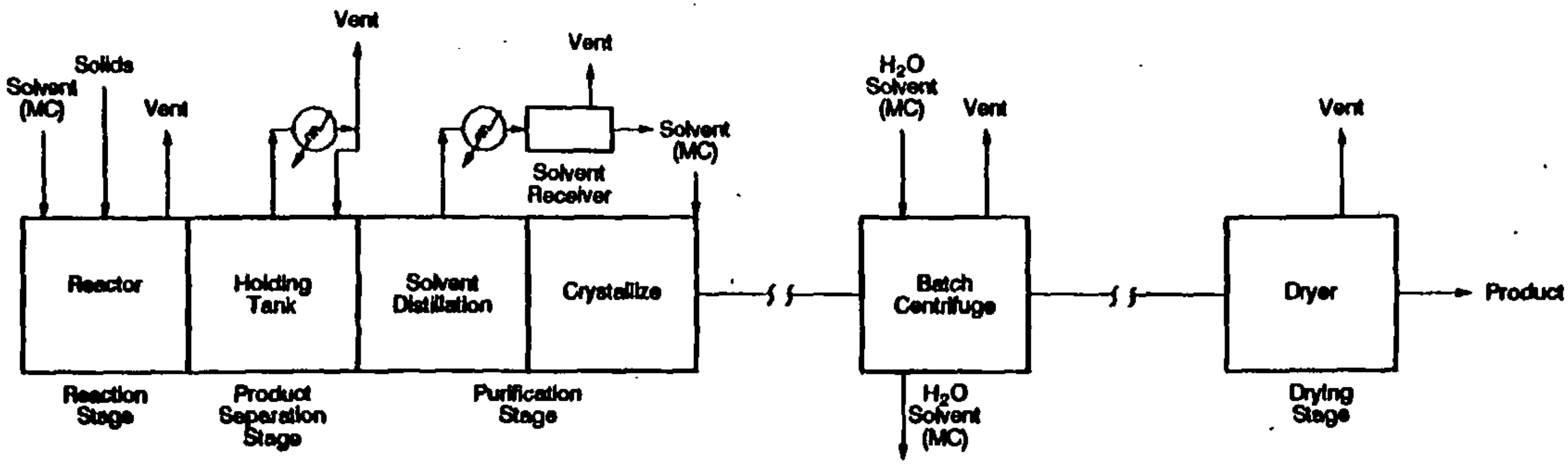
Even though MC has properties conducive to manufacturing pharmaceuticals, there has been an effort to reduce the amount used by the industry because of possible negative health effects. Solvent substitutes such as methanol and ethanol have been considered. However, these substances are not always suitable because of flammability and health concerns. Petroleum distillates and aqueous solutions are being substituted for MC at some facilities.[4,8] Pharmaceutical manufacturing operations are very diverse with some plants using chemical synthesis to produce active ingredients (fermentation and natural extraction are alternative means) and some plants formulating final products (capsules, tablets, etc.). Facilities may conduct one or more of the above operations.

Process Descriptions

Synthetic Organic Pharmaceutical Chemical Process--

Pharmaceuticals typically are manufactured in a series of batch operations. The four successive stages of pharmaceutical production include: chemical reaction, product separation, purification, and drying. Figure 7 shows a typical batch synthesis operation.[2] In the chemical reaction stage, raw material solids and solvents such as MC are mixed in a reactor vessel in which the chemical reaction is carried out, sometimes under elevated temperature and pressure. The stainless steel or glass-lined carbon steel reactor vessel is either an open tank or an enclosed vessel, both equipped with an agitator. Peripheral equipment such as condensers, a refrigeration unit, or a vacuum system can be added to allow the reaction to take place at very high or low temperatures and/or pressures. Some reactors are equipped with a condenser for recirculation of the solvent.

After completion of the chemical reaction, the pharmaceutical products are separated during the product separation stage. The effluent is pumped from the reactor to a holding tank where the reaction products are washed to remove unreacted raw materials and



Source: Reference 2

Figure 7. Typical synthetic organic pharmaceutical chemical process.

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byproducts. The washed reaction products are then piped to various separation process tanks. Product separation often utilizes an extraction process in which a solvent (such as MC) preferentially dissolves one of the reaction products.

Distillation, crystallization, and filtration are among the purification techniques used after product separation or extraction. Following product separation, the crude extracted product is purified by crystallization of the desired compound from a supersaturated solution. A filter press is usually used to separate the concentrate from the solvent. The purified product and remaining solvent are then separated in a centrifuge. The cake may be further washed with water or another solvent to remove impurities before drying.

After the completion of the purification processes, products are moved to dryers, such as tray, rotary, or fluidized bed dryers, which use hot-air circulation or are operated under a vacuum to remove the remaining solvents or water from the product.[4]

Tablet Coating Process--

Tablets are coated in rotating open-ended pans that range from 90 to 150 cm (36 to 60 inches) in diameter. The coating is sprayed on the tablets in the pan while warm air (30°C) flows across the pan at a typical rate of 28 cubic meters per minute (1000 cubic feet per minute). The coating solution is made up of MC and alcohol (about 70/30) but water alone can be used.[8] The air evaporates the solvents, leaving coated tablets. Spray coating and drying takes 2 to 3 hours per batch. A large plant might have 20 pans, whereas a small plant might have only two. Any number of pans can be in use at any given time. The pans are usually cleaned after each batch, even if multiple batches of the same material are made.

Pharmaceutical products may also be coated by the Wurster process. In this process, the tablets or pellets are suspended in a fluidized bed while the spray solution is applied using a stream of heated nitrogen.[7,8] Methylene chloride is used as a solvent along with alcohol (70/30) to dissolve the solids used to coat the tablets. This solution is then sprayed on the cores, the solvents evaporated off, and the vapors condensed and collected in a tank for reuse in the next batch.[8] This method is used most often for coating pellets (smaller particles that are later encapsulated), whereas coating pans are used most often for coating tablets (standard dosages). A good example of pellet coating would be over-the-counter 12-hour cold capsules.

Most tablets are coated with sugar, methyl cellulose, or ethyl cellulose. Cellulose coatings may use either a water or an organic solvent such as MC. Chloroform can be used in place of MC. The use of water as a solvent or solvent component reduces VOC emissions, but more time and heat are required to evaporate the water than for an organic medium. Therefore, this is a production consideration. Also, products that are sensitive to water and/or heat may preclude the use of aqueous coatings. The use of heat or vacuum can expedite evaporation, but this rapid evaporation can peel or roughen the coating.

According to one manufacturer, the rotating pan units can process batches between 400 and 800 kg (900 and 1,700 lbs), with a total yearly throughout between 192,000 and 363,000 kg (423,000 lbs and 799,000 lbs), of which 71,140 kg to 134,380 kg (156,510 lbs to 295,630 lbs) is product.[8] Batch sizes using the Wurster process may vary, with a minimum of 860 kg/batch (1,891 lbs/batch) to a maximum of 3,787 kg/batch (8,331 lbs/batch). In a year's time, a total of 112,820 kg (248,203 lbs) of material were processed through the Wurster column, of which 12,072 kg (26,558 lbs) was product.[8]

Emission Sources

Pharmaceutical Chemical Synthesis--

Methylene chloride is released during storage, transfer, reaction, separation, purification, and drying processes of pharmaceutical chemical synthesis.[4] Storage emissions result from displacement of air containing the solvent during tank charging. Chemical transfer operations, such as manually pouring solvent drum contents, is a source of emissions. Reactor emissions result from the displacement of air containing MC during reactor charging, solvent evaporation during the reaction cycle, venting of uncondensed MC from the overhead condenser during refluxing, purging of vaporized MC following a solvent wash, and opening of reactors during the reaction cycle to take quality control samples. Distillation condensers can emit MC as uncondensed solvent.

During crystallization, emissions can result from the venting of vaporized solvent if the crystallization is being done by solvent evaporation. If crystallization is accomplished by cooling of the solution, there are few emissions. Dryers are potentially large emission sources; emission rates vary during drying cycles, and with the type of dryer being used. Emissions from air dryers are normally greater than those from vacuum dryers mainly because air dryer emissions are more dilute and difficult to control.[2,4]

Below is a ranking, in order of decreasing emissions, that illustrates relative expected total VOC emissions from uncontrolled pharmaceutical chemical synthesis process sources.[2]

- Dryers
- Reactors
- Distillation systems
- Storage and transfer systems
- Filters
- Extractors
- Centrifuges
- Crystallizers

For most pharmaceutical facilities, the first four listed process sources will account for the great majority of total plant MC emissions.[2] In addition to the eight sources listed above, fugitive emissions result from leaks in equipment components. The list differs if controlled emissions are considered because emissions from reactors and distillation systems can often be very efficiently condensed.

Tablet Coating--

Most emissions from tablet coating are process vent exhaust emissions from pan tablet coating. Although the exhaust emissions are often very dilute, they can be controlled with activated carbon adsorption,[7] which enables the manufacturing facility to recover the MC solvent. Emissions from tablet coating storage and transfer operations, as well as fugitive emissions, are similar to those from pharmaceutical chemical synthesis.

The Wurster process is operated as a totally closed system with a solvent recovery system based on a refrigerated condenser maintained at about 25°C, so emissions from this process are limited to approximately 2 percent.[8]

Emissions Data and Controls

Emission Factors--

Surveys of drug manufacturers in 1975, 1982, and 1985 estimated the final disposition of total MC usage. The responding firms were estimated to represent approximately one-half of the production of ethical (prescription) domestic pharmaceuticals in those years. The amount emitted into the air (instead of being incinerated, disposed of into the sewer, etc.) varied from 43 to 67 percent of total MC consumed.[9-12] Table 23 illustrates the disposition of MC for all three years.

Some emission factors were developed from 1985 process data obtained from the Ciba-Geigy facility in Summit, New Jersey. This information is summarized in Table 24.[8] Emission factors for tablet coating are shown both prior to control and after control by carbon adsorption. No other current emissions data from pharmaceutical manufacturing facilities were located.

As discussed previously in Section 4 for MC producers, site-specific emissions estimates can be developed using the AP-42 methodologies for storage tanks, the "Protocols" methodologies for equipment leaks, and the wastewater CTC document methodology for wastewater. Example calculations are given in Appendix A.

Applicable Controls for Pharmaceutical Chemical Synthesis--

Applicable controls for the vented emissions mentioned earlier, except storage and transfer, are: condensers, scrubbers, and carbon adsorbers.[2] Incinerators are not currently widely used to control

TABLE 23. METHYLENE CHLORIDE PURCHASES AND ULTIMATE DISPOSITION BY PHARMACEUTICAL MANUFACTURERS

Year of Data	Annual Purchase (metric tons)	Ultimate Disposition (percent)					
		Air Emissions	Sewer	Incineratio n	Solid Waste or Contract Haul	Other Disposal	Product
1975	10,000[a]	53	5	20	22	--	--
1982	11,375[b]	43	5	38	11	3	--
1985	1,539[c]	67	8	4	10	7	3

Source: References 9-12.

[a] Data represent 26 pharmaceutical manufacturers, which account for approximately 53% of 1975 domestic sales of ethical pharmaceuticals.

[b] Data represent 17 pharmaceutical manufacturers, which account for approximately 50% of 1982 domestic sales of ethical pharmaceuticals.

[c] Data represent 13 pharmaceutical manufacturers. Information concerning percentage of domestic sales (as in 1975 and 1982 data) not available.

TABLE 24. METHYLENE CHLORIDE EMISSION FACTORS FOR PHARMACEUTICAL MANUFACTURING

Industrial Process	Emission Source	Emission Factor	Control Status
Pan tablet coating	Process Vents	0.053 kg MC/kg product 0.001 kg MC/kg product	Uncontrolled Controlled (dual carbon bed adsorber)
Blender	Process Vent	0.003 kg MC/kg active ingredient processed	Uncontrolled
Coating solution holding tank	Process Vent	0.01 kg MC/kg coating solution processed	Uncontrolled
Coating solution mixer	Process Vent	0.0001 kg MC/kg coating solution processed	Uncontrolled

Source: Reference 8.

NOTE: Emission data are for one facility only and do not represent average emissions for all such sources, or total emissions for all sources.

vapor phase organic emissions from synthesized drug production facilities.[2] Part of the lack of use may be due to the variability of waste gases that would be ducted to an incinerator and the batch nature of the processes. Fluctuating flows and pollutant concentrations may hamper safe and efficient operation. Therefore, incinerators would most likely find application where relatively stable waste gas flows can be established. Stability may be enhanced by ducting emissions from several sources to a common control device. It should be noted that incineration of MC results in hydrogen chloride (HCl), which is also an air pollutant.

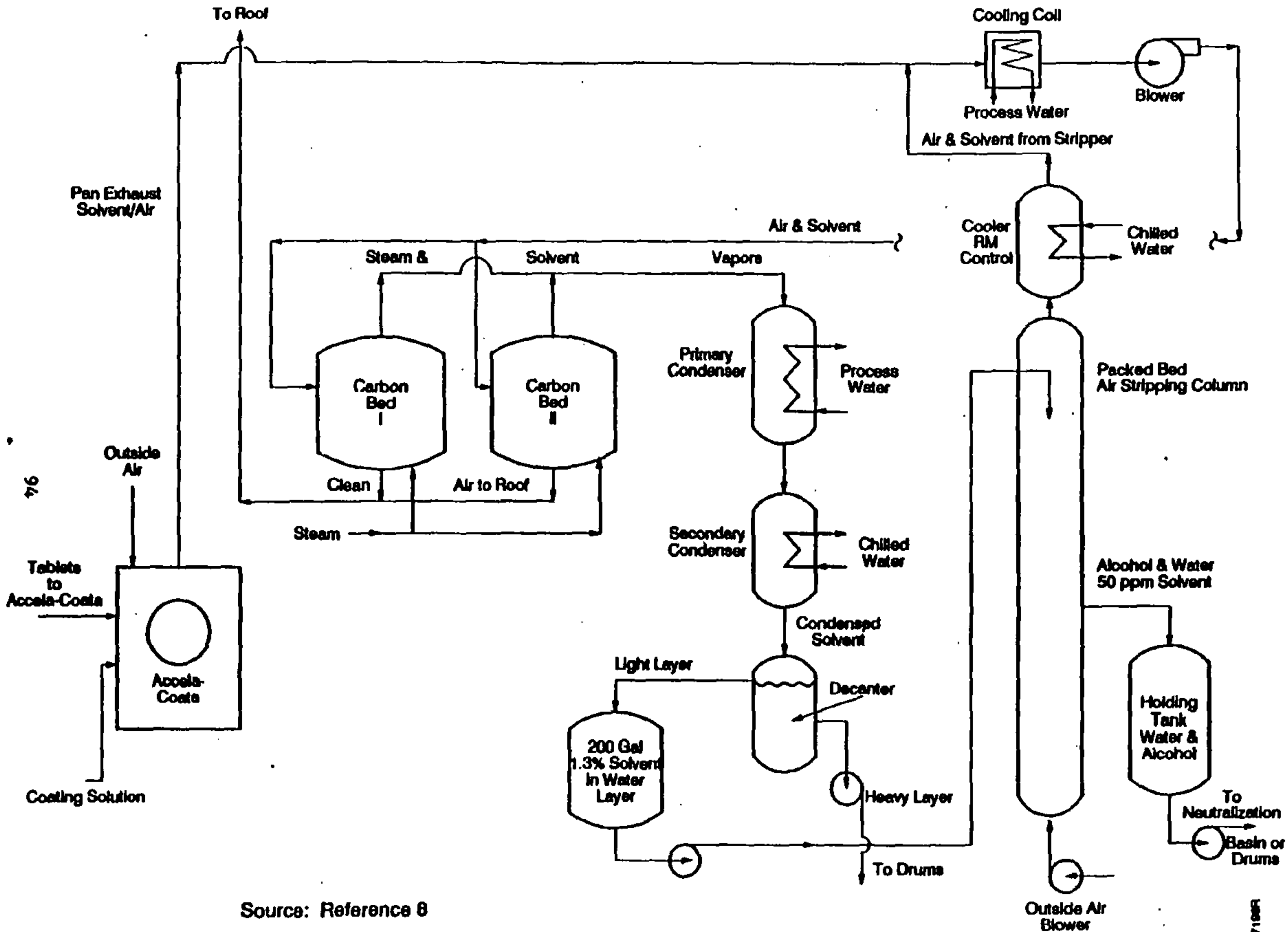
Another potential disadvantage of using incinerators is that heat recovery is likely to be uneconomical because at pharmaceutical plants incinerators will be relatively small and the potential energy recovery correspondingly small, especially when viewed in light of the costs for installing heat recovery equipment.[2] In addition, the incinerator would generally run less than 24 hours a day. In this case, heat recovery would be intermittent, thus decreasing its utility.

Storage emissions can be controlled by storing MC in pressure tanks or by venting storage emissions to a control device such as a condenser, scrubber, carbon adsorber, or combustion device. Floating roofs would be feasible controls for large, vertical storage tanks.[2] These controls are the same as those applicable to emissions from MC production. Transfer may be controlled by vapor balancing, where MC vapors are returned to the storage tanks; or transfer emissions may be vented to a control device.

Control of equipment leak emissions may be accomplished through a regular inspection and maintenance program, as well as by equipment modification. See Section 4 for more information regarding equipment leaks.

Applicable Controls for Tablet Coating--

Figure 8 is a schematic of the pan tablet coating process solvent recovery system.[8] In this control method, the MC-contaminated air from the dryer is passed through a bed of activated carbon (with control efficiencies of 98+ percent). When the carbon bed becomes loaded with

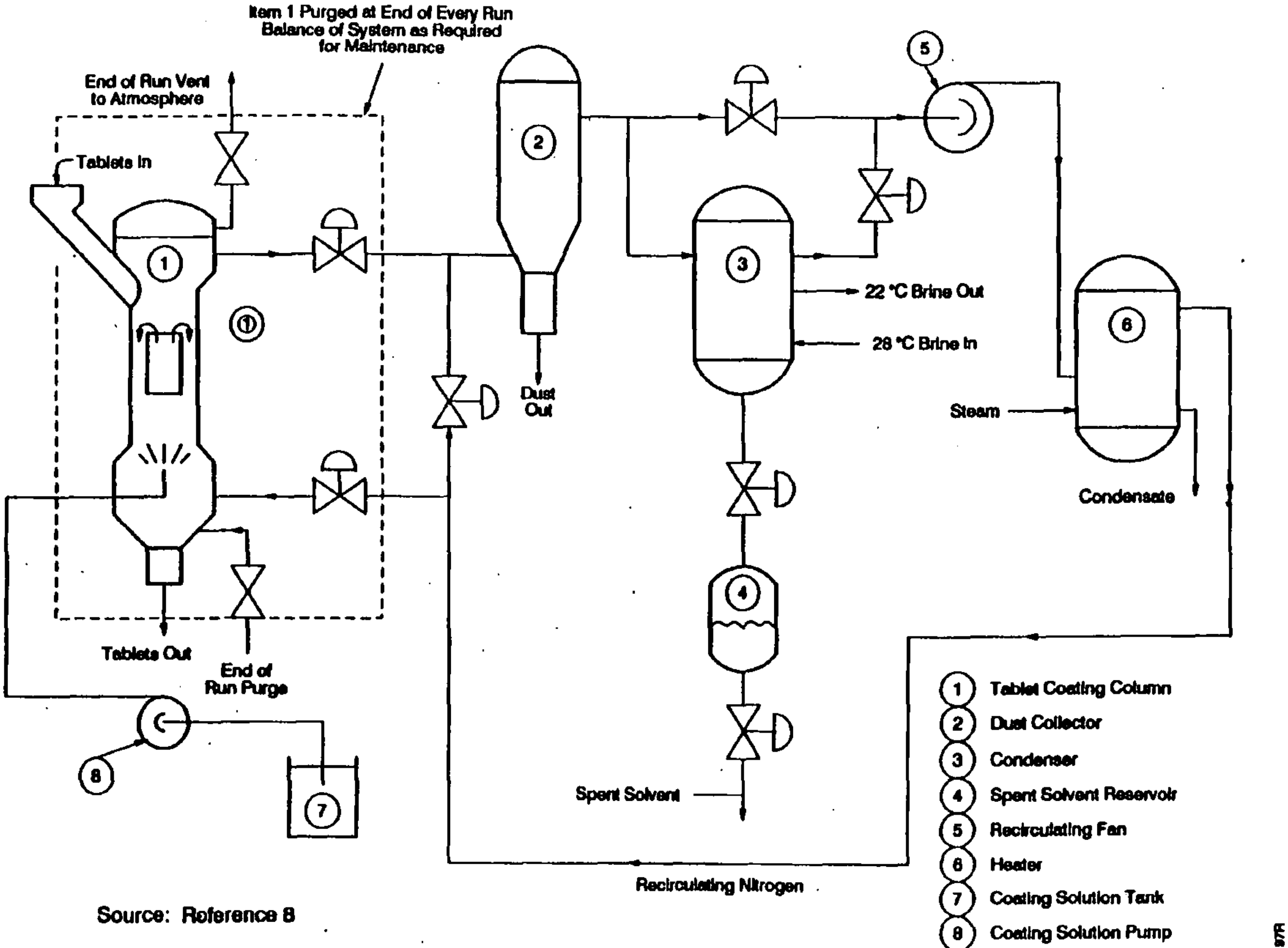


Source: Reference 8

Figure 8. Pan tablet coating process solvent recovery system.

organic compounds, it is stripped with low-pressure steam. Because MC is insoluble in water, it is easy to separate from the steam condensate for reuse. Any ethanol that is captured is miscible with the steam condensate and is impractical to salvage. The condensate, which contains 1-2 percent alcohol, is usually discarded to a sewer. In a large pharmaceutical plant, this wastewater stream is processed in the plant wastewater treatment system.[7]

Figure 9 describes the Wurster process solvent recovery system.[8] With this system, about 98 percent of the solvents are recovered and reused as is. Because there is no contact with water, no solvents find their way to the sewer system.[8] The remaining 2 percent of solvents are presumably emitted into the air.



Source: Reference 8

Figure 9. Wurster process solvent recovery system.

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SOLVENT CLEANING AND PHOTORESIST STRIPPING

An estimated 11 percent (16,420 Mg) of total 1991 United States MC consumption was used for metal cleaning (also called degreasing) in a variety of manufacturing processes, and 3 percent (3,400 Mg) was used for photoresist stripping in printed circuit board manufacture in the electronics industry.[1,2]

Solvent cleaning is a process used to remove water-insoluble soils from metal, plastic, fiberglass, printed circuit boards, and other surfaces. Water-insoluble soils include grease, oil, waxes, carbon deposits, fluxes, tars, metal chips, mold-release agents, and oxidation layers. Solvent cleaning is used by a variety of industries that employ cleaning processes as part of their manufacturing process or prior to painting, plating, inspection, repair, assembly, heat treatment, and machining. Typical industries that use solvent cleaning processes include furniture and fixtures, fabricated metal production, electric and electronic equipment, transportation equipment, plumbing fixtures, aerospace manufacturing, miscellaneous manufacturing, primary metals, automobile and electric tool repair shops, and railroad, bus, aircraft, and truck maintenance facilities.[3] Because of the large number of solvent cleaning operations existing within many different industries, information on the location of the individual solvent cleaning equipment is difficult to obtain. The following sections discuss the solvent cleaning industry, cleaning process descriptions, and emissions.

Process Descriptions

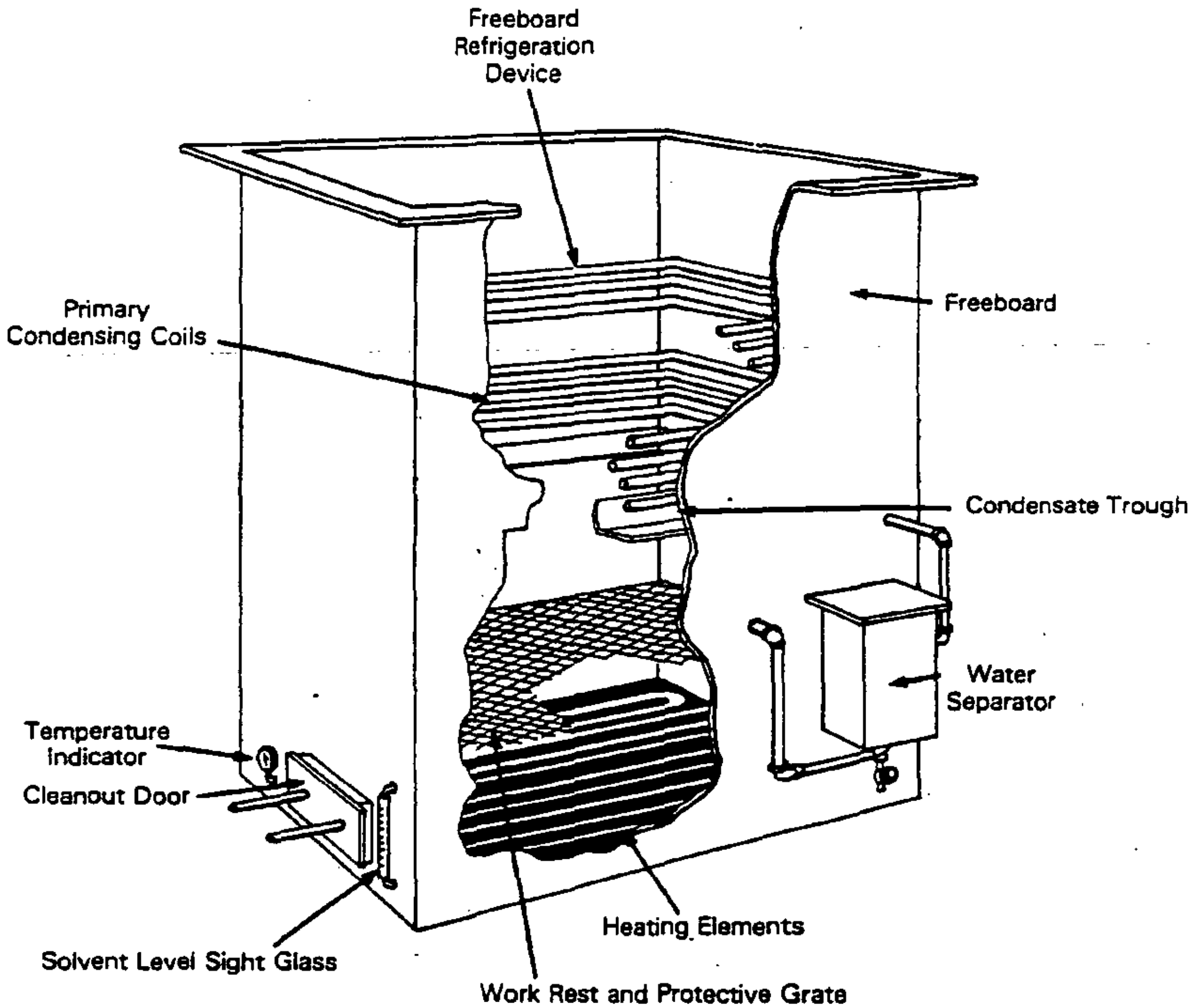
Solvent cleaning processes are typically performed by two basic types of solvent cleaning equipment: batch cleaners and in-line cleaners (also called continuous cleaners). Both cleaners exist in designs for use with solvent at room temperature (cold cleaners) or solvent vapor (vapor cleaners). Methylene chloride solvent cleaning processes for each solvent cleaner [e.g., batch vapor cleaners, in-line cleaners (cold and vapor), and batch cold cleaners] are discussed in the following sections.

Batch Vapor Cleaner Process Description--

Batch vapor cleaners heat solvent to a boiling point, creating a solvent vapor zone into which items to be cleaned are lowered. The cleaning process involves the solvent vapor condensing on the item and stripping soils away. Cleaning can also be supplemented or replaced by immersing items into the liquid solvent during the cleaning cycle. Batch vapor cleaners include open-top vapor cleaners (OTVC), and non-OTVC batch cleaners developed with design variations to meet particular workload characteristics and cleaning demands for particular applications.[3]

Open-top vapor cleaner and non-OTVC batch cleaners are designed to generate and contain solvent vapor. The basic OTVC batch cleaner is illustrated in Figure 10. It is equipped with a heating system or pump to boil liquid solvent. As the solvent boils, dense solvent vapors rise to the level of the primary condensing coils. The primary condensing coils circulate coolant (e.g., water, refrigerant) through the coils, providing continuous condensation of the rising solvent vapors and creating a controlled vapor zone that prevents most vapor from escaping the tank. Solvent vapor and moisture in the air collect in a condensate trough along the sides of the OTVC below the primary condensing coils. This condensate goes into a water separator. The water separator is a container that separates the water from the liquid solvent, returning solvent to the cleaner and routing water for use in another process within the facility/plant or to disposal to a publicly owned treatment works (POTW) system. Some batch OTVC cleaners may also use a canister of desiccant to replace or aid the water separator in its reduction of water contamination. The OTVC walls also extend above the top of the vapor zone. This area is called the freeboard. A freeboard reduces air currents and disturbance of the vapor zone boundary.[3]

Design variations of OTVC batch cleaners are numerous, and depend on the particular characteristics and demands of the workload. Examples of design variations incorporated in OTVC batch cleaners include stills, lip or slot exhausts, covers, and multiple-chamber cleaners. Stills are used to extract soils from the solvent sump and return clean solvent to the machine, decreasing the need to replace the cleaning solvent because of impurities. Lip or slot exhausts are designed to capture solvent vapors escaping from the OTVC and carry them away from the work area, and are incorporated to reduce occupational exposure. Covers, in varying designs, are used to limit solvent losses and contamination during downtime or idling time. Multiple-chamber design variations can include various solvent-cleaning methods (e.g., vapor, immersion, spraying).[3]



Source: Reference 3

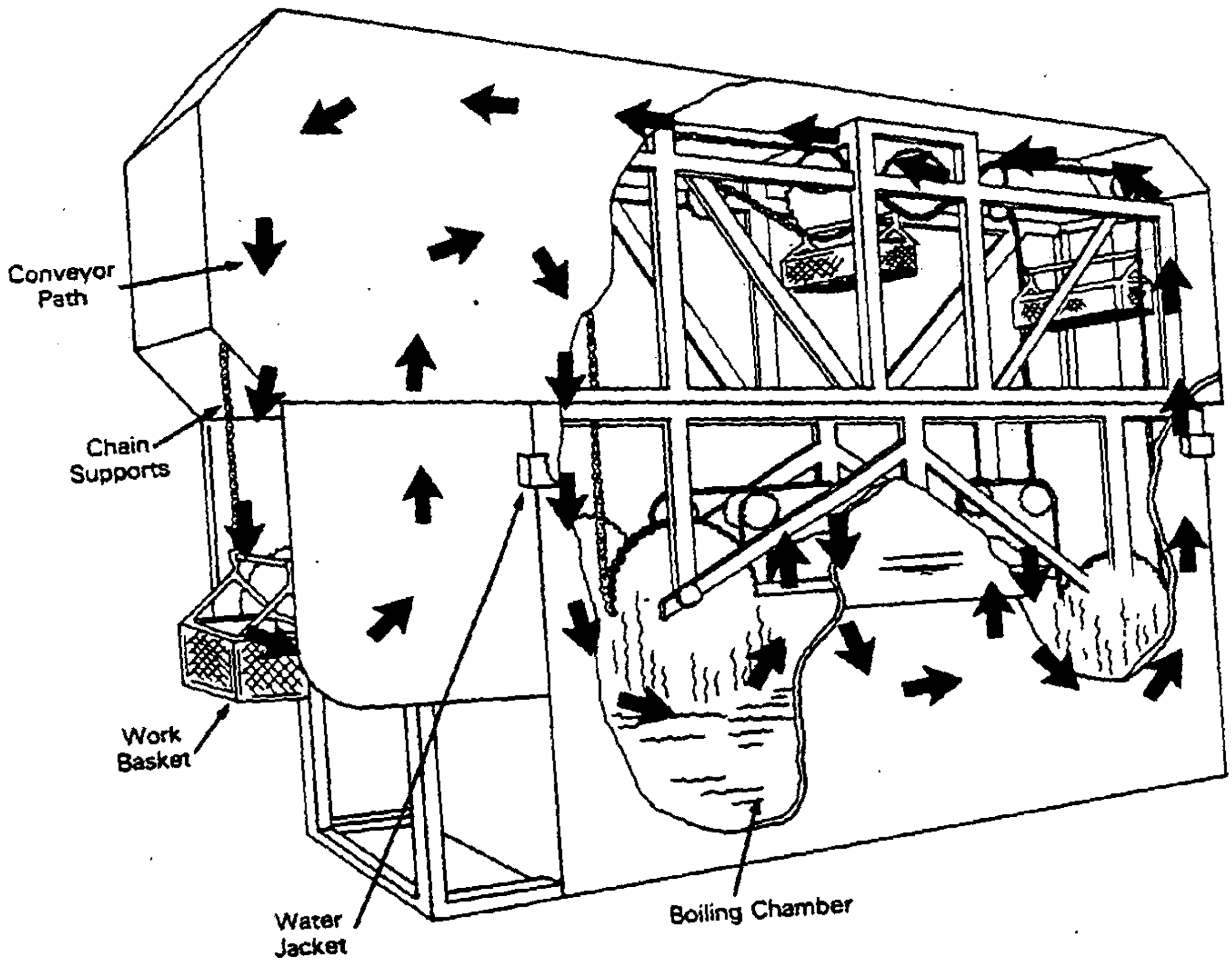
Figure 10. Open top vapor cleaner.

There are some batch vapor cleaners that are not OTVCs. These include cleaners into which a batch of parts is loaded, and then moved through the cleaner on a conveyor (called a conveyorized batch cleaner) and batch cleaners that are more enclosed than OTVCs. These batch vapor cleaners tend to be larger than the OTVC batch cleaners and employ similar cleaning methods (e.g., condensing vapor, immersion, spray). These cleaners are a hybrid of an OTVC and continuous cleaner. Examples include cross-rod, vibra, ferris wheel, and carousel cleaners. An example of a cross-rod, non-OTVC batch vapor cleaner is illustrated in Figure 11.[3]

The cleaning process for OTVC and non-OTVC batch cleaners entails solvent vapors condensing on the cooler workload entering the vapor zone until the workload temperature approaches the temperature of the vapor. The condensing solvent dissolves and flushes soils from the workload until condensation ceases and the vapor-phase cleaning process is complete. As discussed previously, the vapor cleaning process can also include immersion of the item to be cleaned into the hot, liquid solvent.

Immersion batch vapor cleaning processes often include the use of ultrasonics. Ultrasonics uses high-frequency sound waves that produce pressure waves in the liquid solvent. The areas of low pressure within the solvent form small vapor pockets that collapse as the pressure in the zone cycles to high pressure. The creation and collapse of these vapor pockets aids in cleaning by providing a scrubbing action.

Because of their higher boiling points, impurities (e.g., grease, soil, wax, etc.) from the cleaning process minimally contaminate the solvent vapors. Solvent can be used in vapor cleaning for a longer time than in cold cleaning because of the affinity of the solvent vapor to remain relatively pure as compared to immersion cold cleaner solvent. Another variation in the cleaning process is the use of spray solvent below the vapor line. The pressure of the spray and/or the potential for solvent condensation on the workload aids in the physical cleaning of the workload.



Source: Reference 3

Figure 11. Cross-rod cleaner.

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In-Line (Vapor and Nonvapor) Cleaner Process Description--

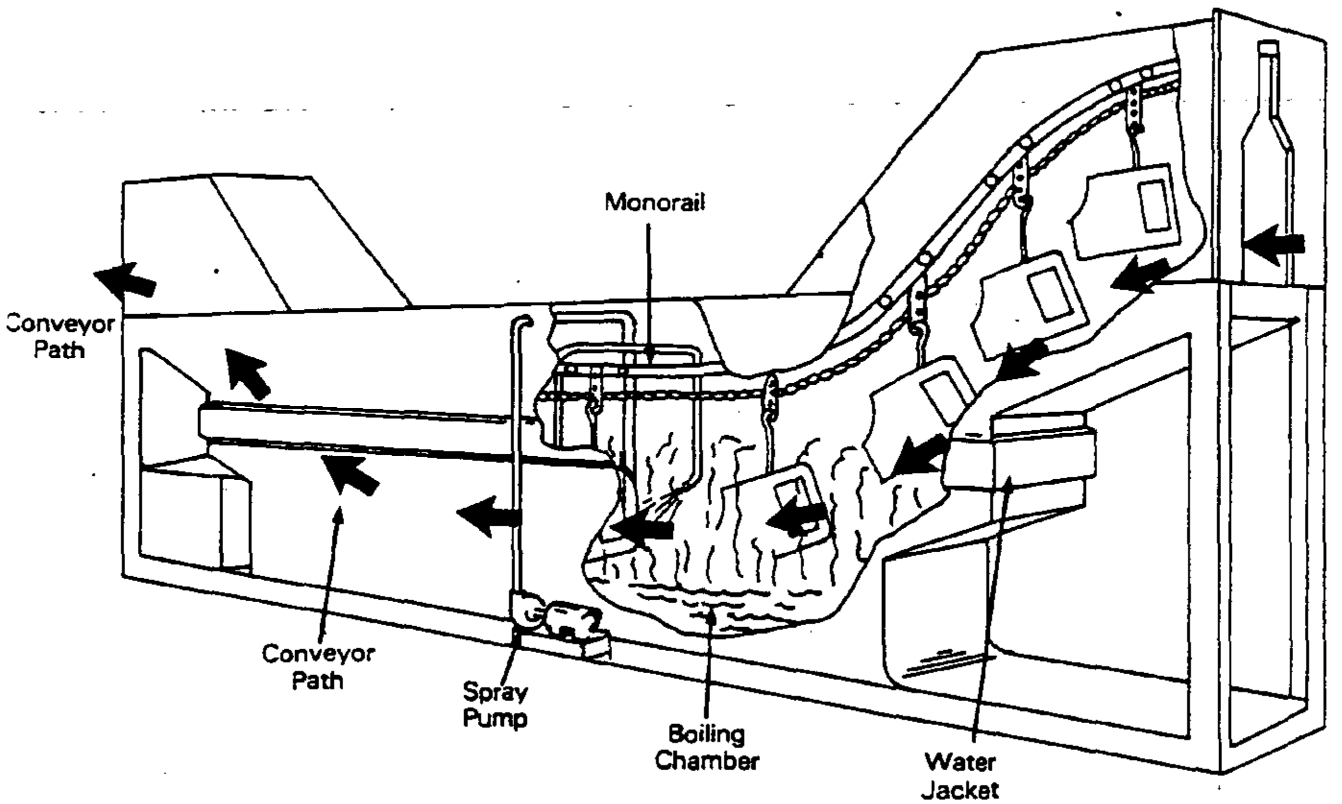
In-line cleaners (also known as continuous cleaners) are cleaners that use automated loading on a continuous basis. The same cleaning techniques are employed in in-line vapor cleaners as with batch vapor cleaners. In-line nonvapor cleaning involves the use of solvent at room temperature, where immersion and spray cleaning techniques can be employed. Most of these cleaners, however, operate as vapor cleaners.[3]

In-line cleaners are usually enclosed, except at the inlet and exit openings where the parts and conveyance pass. They also are typically employed in industries that demand a larger-scale cleaning operation. Design variations within these cleaners are determined by the workload and production rate required. In-line cleaners include monorail, belt, strip, printed circuit board processing equipment (i.e., photoresist strippers, flux cleaners, and developers), and modified cross-rod non-OTVC batch cleaners with both an entry and exit port. An example of a monorail in-line cleaner is illustrated in Figure 12.[3]

Photoresist stripping processes involve using MC to remove any unwanted resist from printed circuit boards. In 1989, 68 percent of MC reported for use in the electronics industry was used in photoresist stripping.[3] Assuming this percentage remained the same for 1991, an estimated 3,400 Mg would have been consumed for use in photoresist operations in 1991.[1,2] A diagram of an in-line photoresist stripping machine is illustrated in Figure 13.[3]

Batch Cold Cleaner Process Description--

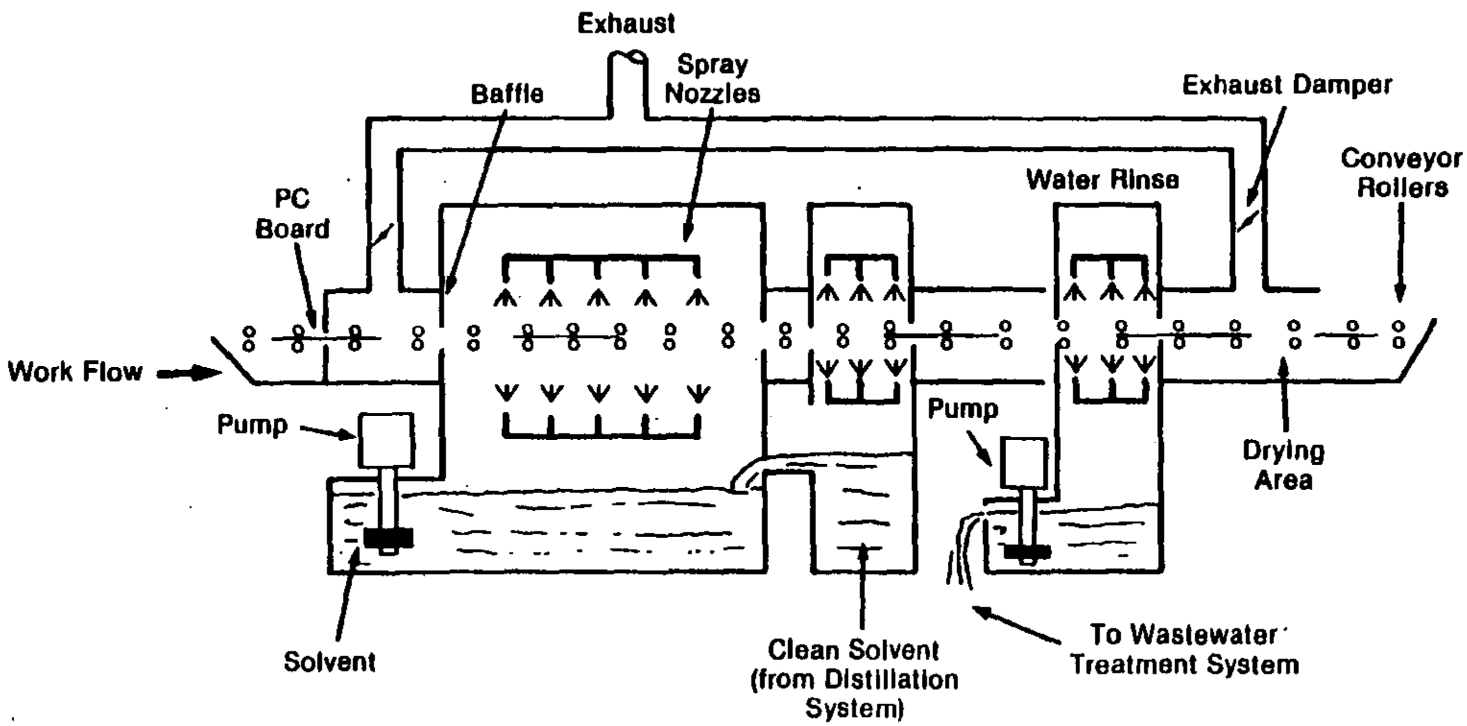
Cold cleaners are usually used in small cleaning solvent maintenance demand situations. The solvent cold cleaning process involves the use of the solvent at room temperature. Cleaning is accomplished by spraying, flushing, wipe cleaning, agitating, or immersing of item to be cleaned with the solvent.



Source: Reference 3

Figure 12. Monorail in-line cleaner.

1682394R



Source: Reference 3

Figure 13. Schematic diagram of an in-line photoresist stripping machine.

0890744R

The only known machine specifically manufactured for cold cleaning purposes (except for non-vapor in-line cleaners) are carburetor cleaners used in automobile repair operations. Methylene chloride is used in these cleaners to increase the soil dissolving power and reduce the flammability potential of the solvent cleaning blend employed. An example of a carburetor cold cleaner is illustrated in Figure 14.[3]

Emissions Sources

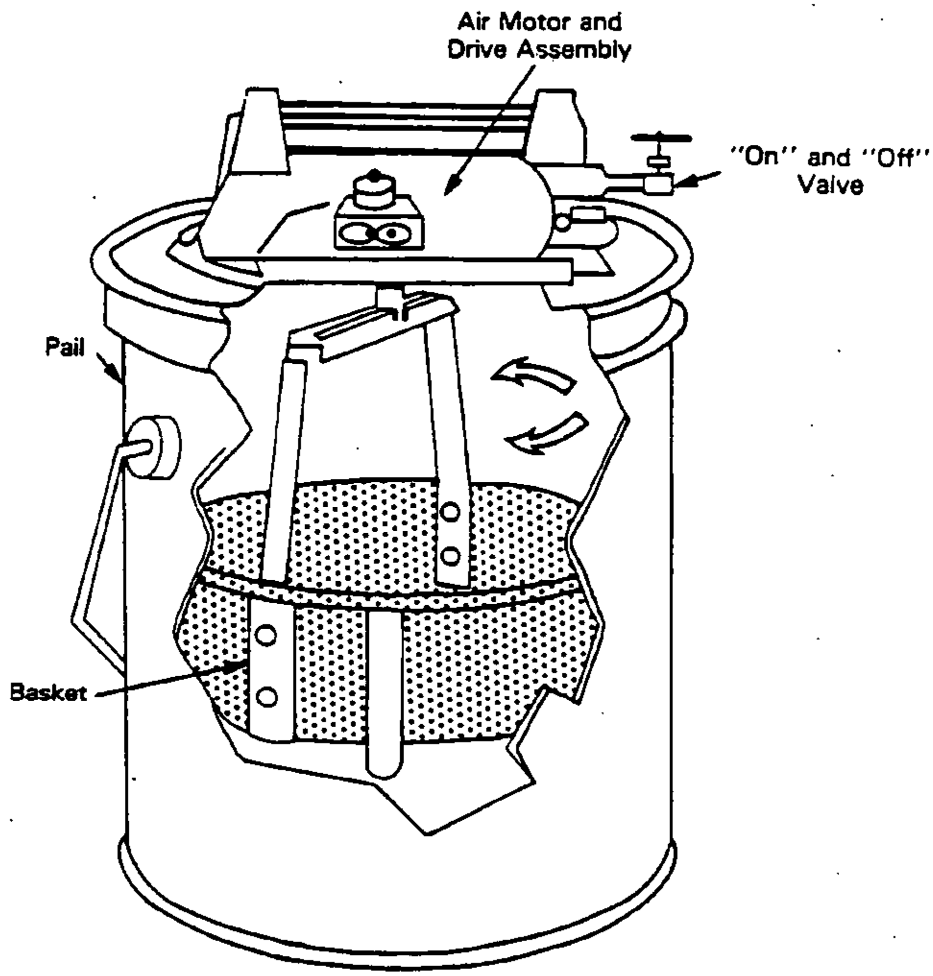
Methylene chloride emissions from organic solvent cleaners are air/solvent vapor interface emissions and workload-related emissions. Air/solvent vapor interface emissions that result during idling conditions (when a machine is turned on and ready to operate) are from solvent vapor diffusion and convection. Workload-related emissions result from the introduction and extraction of items cleaned during the cleaning process and spraying processes (if employed) including emissions that occur by solvent carry-out on the workload. Other solvent emission sources include leaks from cleaners or associated equipment, filling and draining operations, and startup, shutdown, and downtime operations.[3]

Idling Solvent Vapor Emissions--

Air/solvent vapor interface emissions under idling conditions in OTVC batch cleaners result mainly from the diffusion of solvent vapors from the vapor zone to the ambient air. Convection losses occur when the heat of a boiling solvent is translated to the solvent cleaner walls, creating a convective upward flow of solvent vapor to the outside of the cleaner. When air flow is introduced across the air/solvent vapor interface because of draft or lip exhaust, the diffusion rate and convection of solvent vapor to ambient air increases. Figure 15 illustrates batch cleaner idling emission sources.[3]

In-line and non-OTVC batch cleaner idling air/solvent vapor loss mechanisms are the same as for OTVC batch cleaners (e.g., diffusion, convection). Figure 16 illustrates these emission sources for an in-line cleaner. The solvent emissions from in-line and non-OTVC cleaners are expected to be less than from OTVC cleaners because these cleaners are more enclosed and therefore less exposed to drafts and their associated air/solvent vapor emissions.[3]

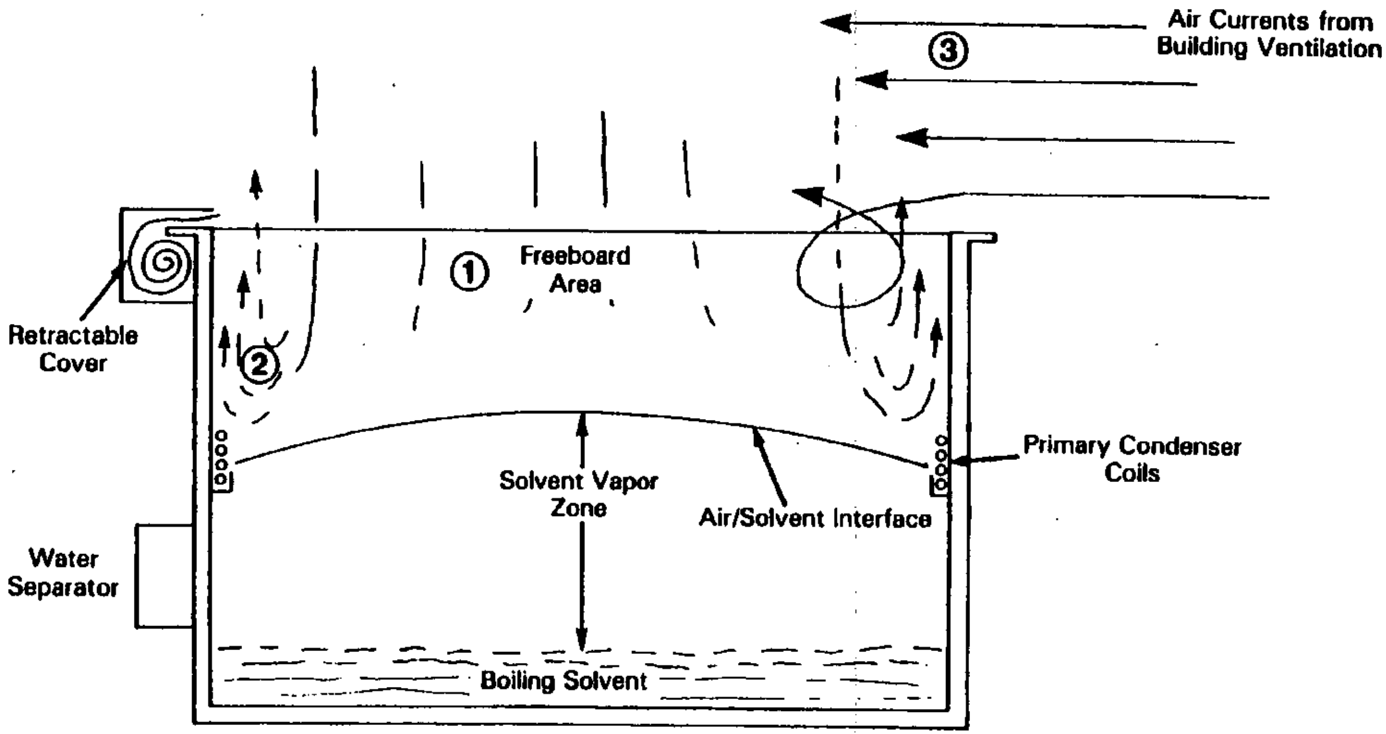
Cold cleaner air/solvent vapor emissions under idling conditions occur from evaporation and diffusion. The only known, manufactured cold cleaner is a carburetor cleaner that generally uses MC with an overlaying water layer (MC is heavier than water), so minimal solvent is expected to evaporate.[3]



Source: Reference 3

1794039R

Figure 14. Carburetor cleaner.

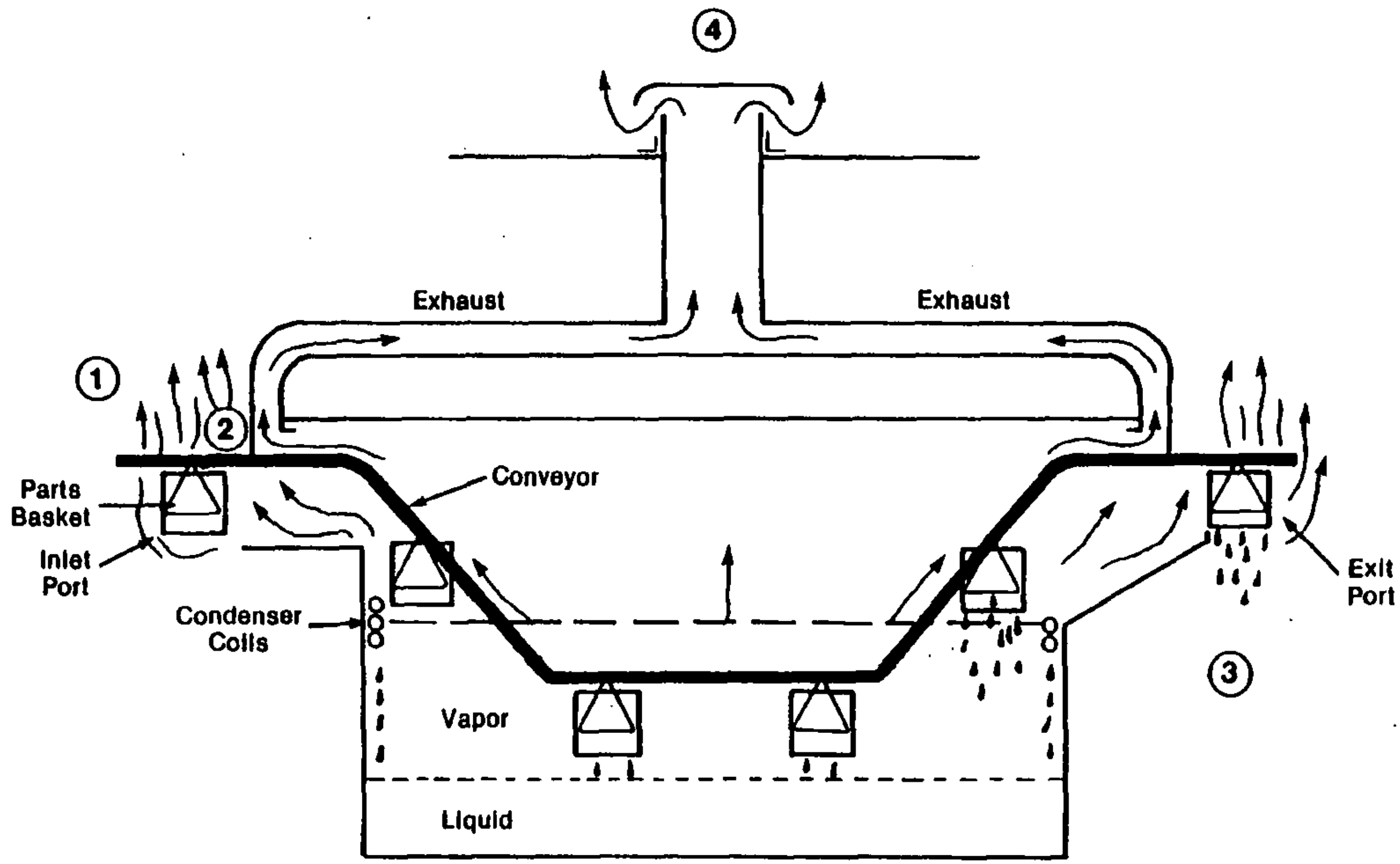


1. Diffusion of Solvent from Air/Solvent Vapor Interface
2. Convection of Solvent Vapor up Warm Tank Walls
3. Diffusion and Convection Emissions Accelerated by Drafts Across Tank Lip (or by Operation of Lip Exhaust Device)

Source: Reference 3

1692415R

Figure 15. Batch cleaner idling emission sources.



1. Diffusion of solvent from air/solvent vapor interface
2. Vapor up warm tank walls
3. Carry-out of liquid solvent on part and subsequent evaporation
4. Roof vent exhaust

Source: Reference 3

0290722R

Figure 16. In-line cleaner emission sources.

Workload-Related Solvent Vapor Emissions--

Workload-related solvent losses from OTVC batch cleaners are due to the turbulence and vapor line fluctuation that occur at the air/solvent vapor interface when items to be cleaned enter and exit the vapor zone. Turbulence occurs when the items to be cleaned enter the cleaner. Emissions are influenced by the means of conveyance (e.g., manual or automated). Emissions occur from diffusion and convection, and increase with the speed of transfer of the items into and out of the cleaner.[3] An automated hoist system set at a fairly low and even speed can reduce both in-plant and atmospheric emissions (when emissions are vented to the atmosphere) by reducing the disturbance of the air/solvent vapor interface.

Solvent loss from work-load-related conditions also occurs when solvent spray cleaning is employed. Solvent spray cleaning causes turbulence in the air/solvent vapor interface. Pooled liquid solvent and residual solvent film remaining on the items cleaned after removal from a cleaner can also be a source of solvent emissions to the air. These are called carry-out losses. If a longer dwell time (i.e., length of time the part remains in the vapor zone)[4] and parts orientation to facilitate drainage of pooled solvent is incorporated, liquid solvent carry-out emissions can be decreased.[3] Simple working practices, such as increasing the part dwell time and parts orientation considerations may offer significant emission reductions (reducing in-plant and atmospheric emissions).

In-line and non-OTVC batch cleaner workload-related solvent vapor emissions are similar to emissions from OTVC batch cleaners. Workload-related emissions from these cleaners, however, are less on a per-part basis than those from manually operated OTVCs. Turbulence at the air/solvent vapor interface (or the air/solvent interface for in-line cold cleaners) is less for these cleaners than for the manually operated OTVCs because of the automation and associated speed control of parts through the cleaning process. Exhaust systems in these cleaners, unless controlled by a carbon adsorber, can result in significant solvent emissions since air movement by exhaust systems may increase diffusion and convection emissions.[3] It is important to note that although exhaust systems may decrease worker exposure in-plant, there is an associated increase in emissions to the atmosphere.

Workload-related solvent emissions from cold cleaners result from solvent agitation and spraying, and solvent liquid and film carry-out. Efforts to facilitate drainage (i.e., tipping of parts, longer drainage time) decrease solvent carry-out emissions.[3]

Other Emission Sources--

Other solvent emissions sources include storage and handling operations, startup, shutdown, and downtime operations, leaks, wastewater, filling and draining operations, distillation operations, and solvent decomposition. These losses will depend on the cleaning machine integrity and design, and the operating techniques employed. Emissions for storage, leaks, and handling losses from the solvent cleaning industry can be estimated by the same methodology as discussed for the MC production industry in Section 4. Appendix A presents an example of simple calculations for fixed-roof storage tanks and equipment leaks; but as described in Section 4, there are also other methods of emission estimation available for equipment leaks and other storage tank configurations. Particular facilities and processes will require differing factors, and reference to EPA Publication No. AP-42 for storage and the "protocols" document for equipment leaks is suggested.

Emission Controls

Solvent control strategies involve machine design and operating practices to minimize emissions from the sources discussed. Available control techniques (including hardware and operating practices) for batch OTVC, in-line (vapor and nonvapor), and cold cleaner operations are shown in Tables 25, 26, and 27, respectively. The EPA published a control techniques guideline (CTG) document for solvent metal cleaning in 1977, and an alternative control technology document for halogenated solvent cleaners in 1989. Thirty-three States and the District of Columbia adopted the CTG-based RACT for solvent cleaning emission.

The CTG developed two levels of control (A and B). Control System A specified simple control equipment (e.g., covers and implementation of good operating practices), and System B required that there be other control equipment (i.e., freeboard extension, freeboard refrigeration device) installed in addition to the System A controls.[3] Presently, a proposal for a National Emission Standard for Hazardous Air Pollutants (NESHAP) for the control of halogenated solvent emissions from cleaners is being developed, and a regulation and supporting document is scheduled to be finalized in 1994.

TABLE 25. AVAILABLE CONTROL TECHNIQUES FOR OTVC OPERATIONS

Source of Solvent Loss	Available Control Hardware	Operating Practices
Air/Solvent Vapor Interface	• 1.0 freeboard ratio (FBR) (or higher) • Freeboard refrigeration device • Reduced primary condenser temperature • Automated Cover • Enclosed design • Carbon adsorber • Reduced air/solvent vapor interface area	• Place machine where there are no drafts • Close cover during idle periods
Workload	• Automated parts handling at 3.4 meters per minute (11 fpm) or less • Carbon adsorber • Hot vapor recycle/superheated vapor system	• Rack parts so that solvent drains properly • Conduct spraying at a downward angle and within the vapor zone • Keep workload in vapor zone until condensation ceases • Allow parts to dry within machine freeboard area before removal
Fugitive	• Sump cooling system for downtime • Downtime cover • Closed piping for solvent and waste solvent transfers • Leakproof connections; proper materials of construction for machine parts and gaskets	• Routine leak inspection and maintenance • Close cover during downtime

Source: Reference 3.

TABLE 26. AVAILABLE CONTROL TECHNIQUES FOR IN-LINE OPERATIONS

Source of Solvent Loss	Machine Design	Operating Practices
Air/Solvent Vapor Interface[b]	• 1.0 freeboard ratio • Freeboard refrigeration device[a] • Reduced primary condenser temperature[a] • Carbon adsorber • Minimized openings (clearance between parts and edge of machine opening is less than 10 cm or 10% of the width of the opening)	
Workload	• Conveyor speed at 3.4 meters per minute (11 fpm) or less • Carbon adsorber • Hot vapor recycle/superheated vapor system	• Rack parts so that solvent drains properly • Conduct spraying at a downward angle and within the vapor zone[a] • Keep workload in vapor zone until condensation ceases • Allow parts to dry within machine before removal
Fugitive	• Sump cooling system for downtime • Downtime cover or flaps • Closed piping for solvent and waste solvent transfers • Leakproof connections; proper materials of construction for machine parts and gaskets	• Routine leak inspection and maintenance • Close ports during downtime

Source: Reference 3.

[a] Applies to in-line vapor cleaners, but not in-line cold cleaners.

[b] Air/solvent interface for in-line cold cleaners.

TABLE 27. AVAILABLE CONTROL TECHNIQUES FOR COLD CLEANERS

Machine Design	Operating Practices
• Manual Cover	• Close machine during idling and downtime
• Water cover with internal baffles	• Drain cleaned parts for at least 15 seconds before removal
• Drainage facility (internal)	• Conduct spraying only within the confines of the cleaner

Source: Reference 3.

Emission Estimates

Solvent usage and emission factors for uncontrolled and controlled cleaners are shown in Table 28.[4,5] In this table, the uncontrolled emission factors are expressed in two ways. The factors on the first line are expressed in terms of MC emitted per total MC used in the cleaning operation. (The fraction not emitted is contained in waste solvent.) These factors may be more representative for estimating emissions from an individual facility that has information on the total MC it purchased (or consumed) for cleaning, regardless of whether that MC was fresh (virgin) solvent from an MC production plant or MC recovered from waste solvent and re-sold by a solvent recycling company.

The second line of factors were developed for estimating emissions from national data on how much fresh MC produced by MC producers was used for solvent cleaning. These factors are expressed in terms of emissions per kg of fresh MC used (see footnote "c").

National baseline emissions calculated using these emission factors are presented in Table 29.[4] These estimates take into account regulated and non-regulated counties in the United States. To estimate emissions, solvent usage for unregulated counties was multiplied by an emission factor that represented

TABLE 28. METHYLENE CHLORIDE USAGE AND EMISSION FACTORS FOR UNCONTROLLED AND CONTROLLED CLEANERS

Parameter	Cold Cleaners	Carburetor Cleaners[a]	OTVCs	In-line vapor cleaners	Photoresist strippers
Emissions Parameter					
Uncontrolled EF w/o recycle [kg emitted/kg total solvent used (fresh and recycled)][b]	0.66	0.66	0.78	0.85	0.70
Uncontrolled EF w/recycle (kg emitted/kg fresh solvent used)[c,d]	0.89	0.89	0.93	0.96	0.90
CTG Control System B efficiency (%)	17.0	60.0	40.0	60.0	60.0
Controlled EF w/recycle (kg emitted/kg fresh solvent used)[c,d]	0.87	0.76	0.89	0.91	0.78
Relative controlled fresh solvent usage (%)[e]	0.85	0.47	0.63	0.43	0.46

Sources: References 4 and 5.

[a] It is assumed that all carburetor cleaners are controlled at baseline, so only the controlled emission factor is used in calculations.

[b] This is the amount emitted by a cleaner per kg of total solvent (MC purchased for cleaning (includes virgin fresh solvent plus solvent bought from recycling companies).

[c] Emission factors are expressed on a fresh solvent (MC) feed basis. The units are kg emitted per kg fresh MC used.

[d] The term "recycle" refers to the information that, on a national basis, 75 percent of the MC contained in waste solvent streams is recovered by recycling companies and resold for further use in cleaning. This results in a reduction in the amount of fresh solvent required for a given cleaning application, but the percentage of fresh solvent usage that is ultimately emitted by the cleaning process is higher. See Appendix E for calculations and assumptions made for uncontrolled emission factor with recycle.

[e] The relative controlled solvent usage is defined as the amount of fresh solvent used by an uncontrolled cleaner to perform a given cleaning job.

EF = Emission Factor

TABLE 29. NATIONAL EMISSIONS OF MC FROM ORGANIC SOLVENT CLEANERS, (1987)[d]

Type of Cleaner	Emissions (Mg/yr) Uncontrolled Cleaners[a]	Controlled Cleaners[b]	Total
Cold Cleaner	9,300	1,480	10,800
Carburetor Cleaner	0	1,620	1,620
Photoresist Stripper	6,540	1,110	7,650[c]
OTVC	3,230	1,490	4,720
In-Line Vapor Cleaner	1,370	430	1,800

Source: Reference 4.

[a] Refer to cleaners that are uncontrolled at baseline.

[b] Refers to cleaners assumed to be controlled with CTG Control System B at baseline.

[c] This includes baseline emissions at 755 Mg/yr reported by nine large photoresist stripping operations responding to EPA questionnaires in addition to emissions of 6,890 Mg/yr calculated using the approach described in this section.

[d] It is important to note that these emission estimates are based on 1983 solvent cleaning consumption estimates for fresh MC. Regulatory activity affecting the use of MC in recent years has resulted in fluctuations and decline in the use of MC. Methylene chloride 1991 consumption estimates for the solvent cleaning industry have been reduced 48 percent when compared with the consumption estimates that were used to calculate the emissions presented in Table 29.[1,3,4] However, it is not possible to apply this percent consumption decrease directly to scale down the 1983 national emission estimates to produce 1991 estimates, because other factors, such as county MC usage patterns and the distribution of controlled versus uncontrolled cleaners, have changed over time. These changes would need to be quantified to estimate emissions from current consumption.

uncontrolled solvent cleaners, and solvent usage for regulated counties was multiplied by an emission factor that represented controlled solvent cleaners.

REFERENCES FOR SOLVENT CLEANING AND PHOTORESIST STRIPPING

1. "Chemical Profile--Methylene Chloride," Chemical Marketing Reporter, 241(9):42, March 2, 1992.

2. "Solvent Use in Electronics--1989," Memorandum from Steve Risotto, Center for Emission Control, HSIA, Washington, DC, to Chris Sarsony, Radian Corporation, Research Triangle Park, NC, April 2, 1992.

3. Alternative Control Technology Document - Halogenated Solvent Cleaners, EPA-450/3-89-030, U.S. Environmental Protection Agency, Research Triangle Park, NC, August 1989.

4. "Calculation of Number of Organic Solvent Cleaners and Solvent Emissions and Use Per Model Plant," Memorandum from R.C. Mead and R.F. Pandullo, Radian Corporation, Research Triangle Park, NC, to D. Beck, U.S. Environmental Protection Agency, Research Triangle Park, NC, September 8, 1987.

5. "Documentation of Emissions and Long-Term Exposure Model Inputs for the Organic Solvent Cleaning Source Category," Memorandum from R.C. Mead and R.F. Pandullo, Radian Corporation, Research Triangle Park, NC, to D. Beck, U.S. Environmental Protection Agency, Research Triangle Park, NC, September 3, 1987.

AEROSOL PACKAGING AND DISPENSING

An aerosol is a suspension of solids or liquid particles in a gas that consists of a liquid and vapor phase. The liquid phase comprises active ingredients, solvent, and liquefied propellant or co-solvent. The vapor phase consists of the propellant that provides the positive pressure to expel the contents of the container.[1]

In an aerosol dispensing system, a liquid propellant keeps the pressure in the container constant as the product is being consumed. Methylene chloride is used in the aerosol industry as a solvent, co-solvent, and vapor pressure suppressor.[2] A solvent with the properties of MC acts to bring the active ingredient into solution with the propellant. A co-solvent is often used with MC when it is desirable to also have another liquid that is not miscible with the propellant (e.g., water). Methylene chloride, because of its high vapor pressure, high boiling point, formulation compatibility, and ability to depress the vapor pressure of high-pressure propellants, decreases the flammability of the formulation mixture and enhances dispersion of the aerosol spray.

Use of MC in aerosols has decreased because of Federal government labeling requirements on consumer goods containing potential carcinogens, such as MC. Substitutes for MC in aerosols with diversified uses include 1,1,1-trichloroethane (TCA), tetrachloroethane, mineral spirits, and water-soluble formulas.[3] Substitutes with limited uses include 1,1,2-trichloro-1,2,2,-trifluoroethane.[3]

Air emissions of MC result from packaging and consumer use of aerosols. The following sections discuss the aerosol packaging industry, aerosol packaging and dispensing processes, emission sources, and emission estimates of MC from aerosol packaging and use.

Aerosol Packaging Industry

There are an estimated 212 aerosol packaging companies, which consumed an estimated 8 percent (10,000 Mg) of the 1991 MC production.[4,5] The U.S. MC demand for use in aerosol products has decreased steadily in recent years because of environmental and occupational health concerns.[5] In 1987, aerosol products containing MC reported by aerosol packaging companies included insecticides, cleaners, lubricants, spot removers, paints, primers, adhesives, sealants, enamels, and mold releases.[6] Since 1987, however, there has been a trend away from the use of MC toward the use of TCA in aerosol products. The U.S. production of TCA, however, is being phased out under the Montreal Protocol and the 1990 amendments to the Clean Air Act, as TCA is considered an ozone depleting substance. There has been a corresponding trend back toward the use of MC.[7] Solvent TCA production levels will be cut incrementally until phase-out at the end of the decade, and buyers are subject to an escalating excise tax to discourage use. Increasing pressure to find other solvent substitutes for MC is being exerted by the new OSHA-proposed MC exposure standard discussed in Section 3.[3]

Industry reports that the product types and range of MC content within the aerosol products reported in 1987 are similar to the MC content range within aerosol products today, but that the number of products, and volume of MC consumed by the aerosol industry has been dramatically reduced.[7] Consumption reduction of MC by the aerosol industry since 1987 is exhibited by Chemical Marketing Reports Chemical Profile of MC in 1991, which estimates a 49 percent reduction in aerosol consumption from 1988 (19,600 Mg/yr) to 1991 (10,000 Mg/yr).[5,8] A national list of 212 aerosol packagers that have the potential to consume chlorinated solvents was developed by the EPA in 1987. Appendix C includes the names, locations, and product types packaged at these facilities when data were available.[4]

Section 114 questionnaires containing questions about MC and other chlorinated solvent emission sources and methods of recovery or control were distributed to nine aerosol packaging companies. Eight of the nine companies' questionnaire responses (containing information on 11 facilities) were analyzed. Table 30 contains a list of aerosol product types reported in the Section 114 questionnaire responses and information on the amount of chlorinated solvent reported for each product type.[4]

TABLE 30. WEIGHT PERCENT OF METHYLENE CHLORIDE IN AEROSOL PRODUCT TANKS, REPORTED BY SECTION 114 QUESTIONNAIRE RESPONDENTS (1987)

	Methylene Chloride	
Product Type	Mean[a]	Range[b]
Spray Paints[c]	27	5-40
Insecticides	19	10-42
Lubricants[d]	17	5-55
Cleaners[e]	26	5-50
Adhesives	37	5-50
Paint Strippers	80	75-85

Source: Reference 4.

[a] The eight Section 114 questionnaire recipients were asked to provide the typical concentrations (weight percent) of chlorinated solvent in each product type. The value is the value of the reported typical concentrations.

[b] The range of typical concentrations reported by the eight questionnaire respondents.

[c] Includes enamels, coatings, primers, and rust inhibitors.

[d] Includes mold release agents and metal cutting fluids.

[e] Includes solvent degreasing cleaners, automotive, household, and electrical contact cleaners.

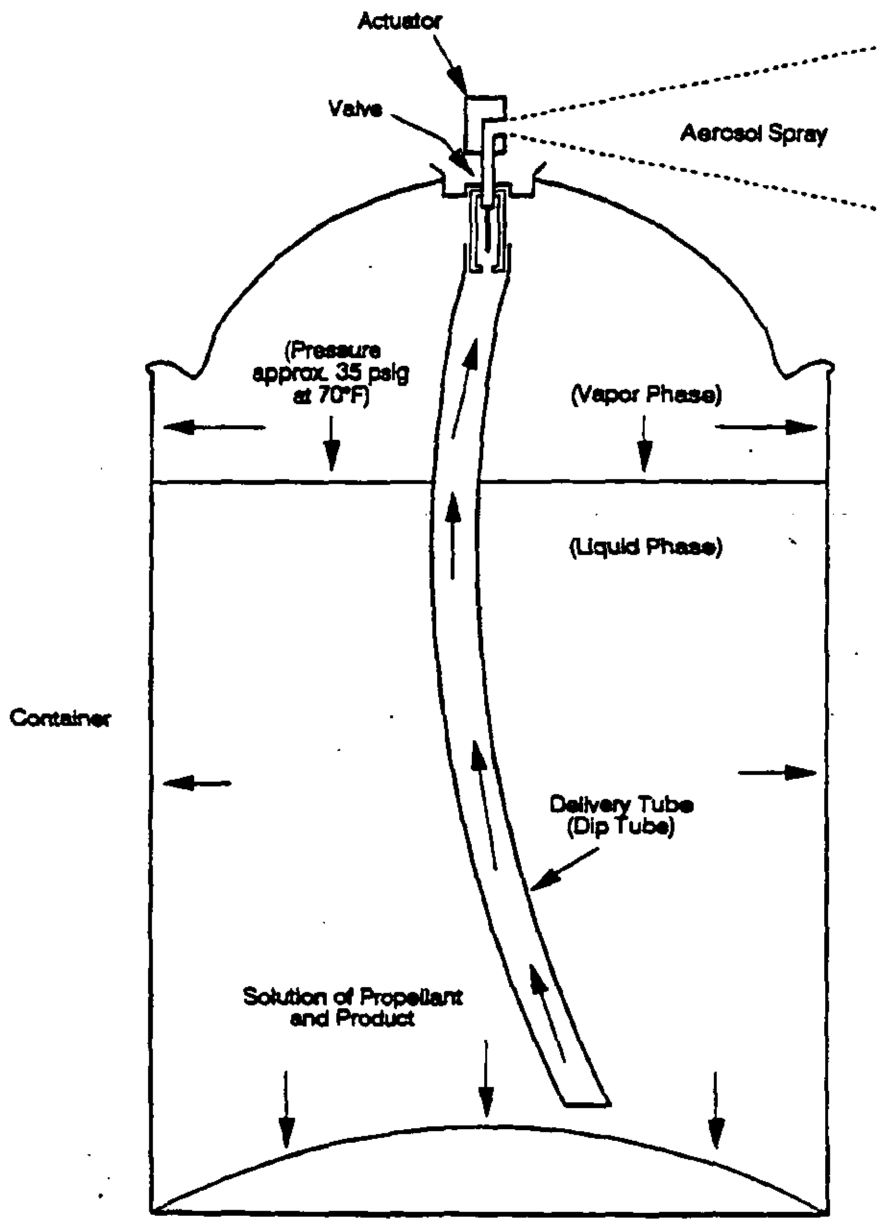
Process Description

Aerosol Packaging--

Aerosol packaging processes are batch-mode operations. Many companies contract out aerosol packaging because of high plant costs. Some companies fill other companies' products as well as their own, while others only fill aerosols for other companies.[3] Methylene chloride is generally supplied by an outside chemical supplier, who delivers the solvent either by a tank truck or by drums. Storage of MC can be in fixed-roof or pressurized tanks, or in the drums (normally 55-gallon drums) in which the solvent was delivered.[4]

The initial stage of the aerosol packaging process involves the mixing of the aerosol product ingredients in mixing tanks of varying sizes. Ingredients, including MC, are either pumped from storage tanks or are poured directly from storage drums. Ingredients are added according to volume or weight. In order to minimize solvent loss due to volatilization, some facilities add the solvent directly to the aerosol cans at the time of filling rather than adding the solvent at the mixing tank stage. Mixing tank ingredients, after being properly mixed, are either pumped or transported to the aerosol can filling lines.[4]

Aerosol can filling involves filling with product, inserting the valve stem and valve, adding propellant, and sealing the product in the can. Empty aerosol cans are conveyed to an automatic filler that uses filling nozzles to deliver the product into the empty cans. Filled aerosol cans are then conveyed to a point where the valve stems and valves are inserted into the can. The cans, still unsealed, are conveyed to a special "explosion-proof" room where the propellant is added to the cans. The cans are then sealed under pressure and conveyed to a point at which actuators are placed onto the stems. To complete the aerosol packaging process, each can is weighed to ensure weight requirements are met, submerged in a hot bath to check for leaks, and washed, labeled, capped, and packaged according to the particular requirements of the product.[4] An example of a typical aerosol spray system is illustrated in Figure 17.[9]



Source: Reference 9

Figure 17. Typical aerosol spray system.

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Aerosol Dispensing--

As illustrated in Figure 17, the aerosol spray dispensing product comprises of four basic components: propellant, product, container, and valve. A propellant is defined by the Department of Transportation as "a material which can expel the contents of an aerosol container at room temperature."[3] Propellants typically are liquefied gases with vapor pressures greater than atmospheric pressure, which enables product contents to be forced from the container when the valve is activated at room temperature. The product contains the solvent, co-solvent, and active ingredients that, in conjunction with the propellant, enable the product to perform its desired end function.

The dispensing process of an aerosol spray is achieved by depressing the actuator, which causes depression of the valve, releasing a solution of propellant and product to the air. The pressurized container allows propellants that are gaseous at atmospheric pressure to exist predominantly as a liquid. As the propellant is released, it converts to gas phase and disperses the product. Some gas-phase propellant remains in the container head space, while the rest is in equilibrium with the product. Examples of propellants used in aerosol dispensing systems include hydrocarbons, dimethyl ether (DME), hydrochlorofluorocarbon-152a (HCFC 152a), and compressed gases.[10]

Emission Sources

Aerosol Packaging--

Aerosol packaging process MC emissions may occur from the following general sources: storage tanks, handling operations (e.g., mixing tank loading), equipment leaks, wastewater, and accidental releases. Emissions from these sources to the atmosphere would be from the following:

- Building openings, which would release MC emissions along with other indoor air emissions;
- Process vents, which would release MC emissions directly from the source to the atmosphere, without dilution by other indoor air emissions; and
- Outdoor sources, which would include equipment used to store and transfer MC, and on-site wastewater treatment facilities.[4]

These MC emission sources from aerosol packaging processes are discussed in the following paragraphs.

Methylene chloride storage tank emissions occur from breathing and working losses. Breathing losses result from changes in barometric pressure and temperature, and working losses result from volumetric changes in the tank from filling or dispensing of stored solvent. Indoor storage tanks are expected to have minimal or negligible breathing losses because of indoor temperature controls that minimize diurnal temperature variation. Pressurized tanks that have pressures greater than the atmospheric pressure are not expected to have MC emissions.[4] An example calculation of storage tank emissions, using AP-42 methodology for storage of organic liquids, is presented in Appendix A. Accurate estimation of storage emissions, as discussed in Section 4, requires site-specific information.

Handling and transfer emissions result from filling and mixing tank operations, aerosol can filling, and aerosol can washing. Filling and mixing tank emissions are considered to be the most significant source of MC handling emissions, and occur as the solvent is added (i.e., the filling) to the mixing tank (as other ingredients are added), and during the mixing process itself.[4] Estimation of handling and transfer emissions require the summation of emissions from handling and transfer operations specific to a facility. The reader is referred to AP-42, Section 4.0, Evaporation Loss Sources, for use as a guideline in the estimation of these emissions.

Methylene chloride equipment leaks result from process equipment components leaking in a liquid or gaseous state. These losses may occur intermittently or continuously.[4] An example calculation for estimating emissions as a result of equipment leaks is presented in Appendix A. Methylene chloride emissions that occur during on-site treatment and disposal of wastewater, liquid waste, or solid waste are considered to be secondary emissions.[4] Appendix A contains a simplified example calculation for estimating MC emissions from secondary wastewater treatment processes. For a more detailed and accurate methodology for estimating MC emissions from secondary wastewater treatment, the reader is referred to the EPA document "Industrial Wastewater Volatile Organic Compound Emissions--Background Information for BACT/LAER Determinations. EPA-450/3-90-004." As with MC production, methodologies to estimate emissions require site-specific parameters in order to represent emission potential accurately.

Methylene chloride emission controls that may be incorporated in the aerosol packaging process include storage tank refrigerated condensers, process vent carbon adsorbers, and process vent refrigerated condensers. The use of refrigerated condensers lowers the vapor pressure, and therefore, the emission potential of the solvent. Additional control techniques with associated control efficiencies for emissions of chlorinated solvents from aerosol packagers is shown in Table 31.[4] Methylene chloride evaporation losses may also be controlled by the use of external or internal floating-roof tanks in place of fixed-roof tanks. Control efficiencies for these tanks vary according to the size of the tank and the type of seal employed.

Aerosol Dispensing Processes--

Emission of MC from aerosols result from the use of the product, and the crushing, compacting, leakage, corrosion, and permeation of the aerosol container that contains MC. Methylene chloride emissions from the consumption of aerosol products result from the volatilization of suspended droplets or by evaporation from sprayed surfaces.

Methylene chloride emission controls that may be employed include minimization of MC content and integrity maintenance of the aerosol container.

Emission Estimates

Aerosol Packaging Process Emission Estimates--

Methylene chloride emission estimates from aerosol packaging processes, based on Section 114 responses in 1987, were determined and documented in 1988 under a previous EPA project.[12] Emissions were estimated for storage tanks, handling operations, indoor and outdoor equipment leaks, secondary sources, and accidental releases. The calculation procedures are documented in another memo.[12] Estimates of emissions from 10 of the 11 1987 Section 114 responses were used to determine MC emissions for the remaining 184 facilities that used

TABLE 31. CONTROL TECHNIQUES FOR EMISSIONS OF CHLORINATED SOLVENTS FROM AEROSOL PACKAGERS (1988)

Emission Source	Control Technique	Emission Reduction Efficiency (%)
Storage tank	Refrigerated condenser	95
Mixing Tanks (Handling)	Carbon Adsorption[a]	95
	Refrigerated condenser[a]	95
Equipment Leaks		
Pump Seals (packaged and mechanical)	Monthly LDAR	61
Flanges	None Analyzed	--
Valves (liquid)	Monthly LDAR	59
Valves (gas)	Monthly LDAR	78
Sample Connections	Closed-purge sampling	100
Open-Ended Lines	Caps on open ends	100
Secondary Sources	None analyzed	0

Source: Reference 4.

[a] Control option also includes covering the mixing tank and installing ductwork from the mixing tank to the adsorber or condenser to recover chlorinated solvent emissions.

LDAR = Leak Detection and Repair

MC in their aerosol products filled.[12] Table 32 presents the emission estimates from these 10 Section 114 responses.

The MC consumption reported in the 10 Section 114 responses was 8,400 Mg/yr, and reported emission estimates were 81.4 Mg/yr. An emission factor for the entire aerosol packaging process, based on the uncontrolled aggregate emissions/consumption for these 10 questionnaire respondents, is 0.01 Mg/Mg MC consumed (19.4 lb/ton consumed).[13]

Aerosol Dispensing Process Emission Estimates--

There are no MC emission estimates available for the use of aerosol products at this time. Trends away from MC use in aerosol products, however, should reduce emissions proportionately to the reduction of use. Methylene chloride content is ultimately considered to be released to the environment via differing media (e.g. soil, air, and water). The only emission factor found in the literature for aerosol products use was the worst-case assumption that MC emissions are 1 kg/kg MC contained in product applied (2000 lb/ton MC contained in product applied).[13]

TABLE 32. ESTIMATED METHYLENE CHLORIDE EMISSIONS FROM AEROSOL PACKAGERS IN 1987

		Methylene Chloride Emissions (Mg/yr)					
					Equipment Leaks		
Company Name	Location	Total	Storage	Handling	Outdoor	Indoor	Secondary
New York Bronze Powder Co.	Elizabeth, NJ	18.1	6.6	8.3	NR	3.2	NR
New York Bronze Powder Co.	Taylor, PA	24.9	2.6	18.1	NR	4.2	NR
Percy Harms corporation	Wheeling, IL	0.6	0[a]	0.4[b]	NR	0.2	NR
Plaze, Inc.	St. Louis, MO	2.4	0.5	0.6	NR	1.3	NR
Seymour of Sycamore	Sycamore, IL	5.8	0.2	5.5[c]	0.1	<0.1	NR
Sherwin-Williams Co.	Anaheim, CA	4.5	0.3	4.1	NR	0.1	NR
Sherwin-Williams Co.	Bedford Heights, OH	9.6	2.0	6.1	0.5	1.0	NR
Sherwin Williams Co.	Elk Grove village, IL	0.8	0.2	0[d]	0.3	0.3	NR
Speer Products	Memphis, TN	13.2	1.4	11.6	0.03	0.2	NR
Zep Manufacturing	Atlanta, GA	1.5	0.2	0.8	0.3	0.2	<.01
Total		81.4	14.0	55.5	1.2	10.7	<.01

Source: Reference 4.

[a] A pressurized tank is used to store MC at this facility.

[b] Estimate includes 0.2 Mg/yr for aerosol can washing.

[c] Estimate includes 1.3 Mg/yr for aerosol can washing.

[d] No mixing operations are used at this facility because aerosol ingredients are added directly from storage to the product containers.

NR = Not reported.

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MISCELLANEOUS

Approximately 5 percent of the total U.S. consumption of MC is for miscellaneous uses such as pesticide manufacture, photographic film processing, food processing, rubber cement and rubber accelerator manufacture, dye carrying, solid waste treatment, storage and disposal (TSD), and site remediation. Information gathered on pesticide manufacture and photographic film processing, the largest two MC users in this miscellaneous group, are discussed briefly in the following text. In addition, MC use in paints and coatings is outlined.

Pesticide Manufacturing

Methylene chloride may be used in two areas of the pesticide industry: (1) the manufacture of the pesticide; and (2) the formulation of the pesticidal materials with the necessary additives and inert carriers. Previous studies indicate that there are about 140 individual pesticide manufacturing facilities and 200 to 300 formulation plants located throughout the United States.[1,2] However, only a fraction of these may use MC.[1] One source estimates that 60 manufacturers/formulators use 10 million pounds of MC per year.[3] The location of these facilities or the amount, if any, of MC used by each were not verified in this study.

Methylene chloride has several applications in the pesticide manufacturing industry, including extraction, phase separation, purification, crystallization, and as a general transport solvent.[1] In the formulation of pesticide products, MC is sometimes used as a solvent to produce liquid products from granular active ingredients.[3] However, according to OSHA, there is an indication that MC usage in pesticide processes will soon be phased out because of health concerns. Products that have been substituted for MC included petroleum distillates, aqueous formulas, mineral spirits, and Agatane.[3]

Because of concern that some inert ingredients in pesticide products might cause adverse effects in humans or the environment, EPA developed a regulatory policy for inert ingredients.[4] The EPA divided the approximately 1,200 inert ingredients contained in pesticide products into four toxicity categories: Lists 1 and 2 contain inerts of toxicological or potentially toxicological concern, and Lists 3 and 4 contain inerts of unknown toxicity or minimal concern. Methylene chloride is found on List 1. According to one pesticide formulator, List 1 chemicals can be used in pesticides as long as there is a warning on the product label, but to his knowledge, most of the constituents (such as chlorinated solvents) are no longer used in these products.[5]

Process Description--

The methods and exact technology for manufacturing pesticides varies considerably depending on the type of pesticide, but MC is frequently used in certain manufacturing steps. The pesticide industry employs the same unit processes and operations used in the chemical processing industry.[1] These include chemical reactions, filtering, separation operations, condensation, and drying. Production processes are usually carried out at ambient or slightly above ambient temperatures. Elemental chlorine is the raw material common to most pesticide production and is also frequently used to prepare other raw materials used for pesticide production.

Emissions--

Air emissions from pesticide facilities include particulates, gases, and vapors that may emanate from process equipment at each step of the manufacturing process.[1] Sources include process vents, storage, transfer, handling, equipment leaks, and wastewater. An inspection of one pesticide manufacturing facility revealed 26 potential sources (e.g., pellet mill, grinding unit, Munson mixer, bagging unit) of air pollution and 13 emission points (e.g., baghouse/cyclone, exhaust hoods, vents, and fans).[6] The MC emissions from three of these emission points can be found in Table 33.[6]

A comprehensive survey of typical control techniques and control levels for pesticide manufacturing/formulating was not undertaken. However, control techniques employed by several pesticide facilities using MC include condensers, recycling systems, and incinerators.[1] In general, applicable control techniques would be similar to those discussed in Section 4 for MC production.

TABLE 33. EMISSIONS FROM THREE POINTS AT A PESTICIDE FACILITY, 1988

Source	MC Emissions kg/yr (lb/yr)
Pellet Mill	334.7845 (738)
Marion Mixer	431.1803 (951)
Liquid Blending Area #1	12.4344 (27)

Source: Reference 6.

NOTE: Emission data are for one facility only and do not represent average emissions for all such sources, or total emissions for all sources.

Photographic Film Manufacture

Methylene chloride is a key component in the manufacture of cellulose triacetate-based films. It is used with heat to dissolve cellulose triacetate pellets in order to produce a fine, transparent layer which is rolled onto photographic paper. This layer must be transparent, durable, and flexible. Other materials used in the manufacturing process are plasticizers and small amounts of other solvents.[9] Virtually all still camera, graphic arts, and photographic films in use in the United States are cellulose triacetate-based. Substitutes for MC in this process have not been identified.[7]

Photographic film is currently produced at two sites. The largest facility is owned and operated by Eastman Kodak, with a facility located in Rochester, New York. This plant consumes approximately 4 Mg (9 million pounds) of MC annually.[8] Anitec Image Technology Corporation in Binghampton, New York uses approximately 0.9 Mg (1.9 million pounds).[9]

Process Description--

Several steps are required in the development of cellulose triacetate film. These steps are represented in Figure 18. Methylene chloride, plasticizers, cosolvents, and solid cellulose triacetate pellets are heated to produce a thin slurry called "crude dope." The dope is 60-65 percent MC by weight.[9] Vapors from this melting process are recovered by use of distillation equipment. The crude dope is then transported through the filtration process by use of a continuous screen, continuous wash, and multiscreen filters. This process is completed in a closed system; however, the continuous wash and multiscreen filters are changed four to five times per day.

The filtered dope is no longer considered crude at this point. It is fed into a receiving hopper that extrudes dope onto a large, polished cylindrical wheel, called a rollcaster. The dope is trimmed from the wheel, leaving a thin sheet or "web" that is dried at 121-138°C in an enclosed chamber. The MC is nearly completely evaporated in this process. The roll casting process is operated in a semi-enclosed manner, with some of the evaporating MC removed, and the remainder exhausted to the atmosphere.[9]

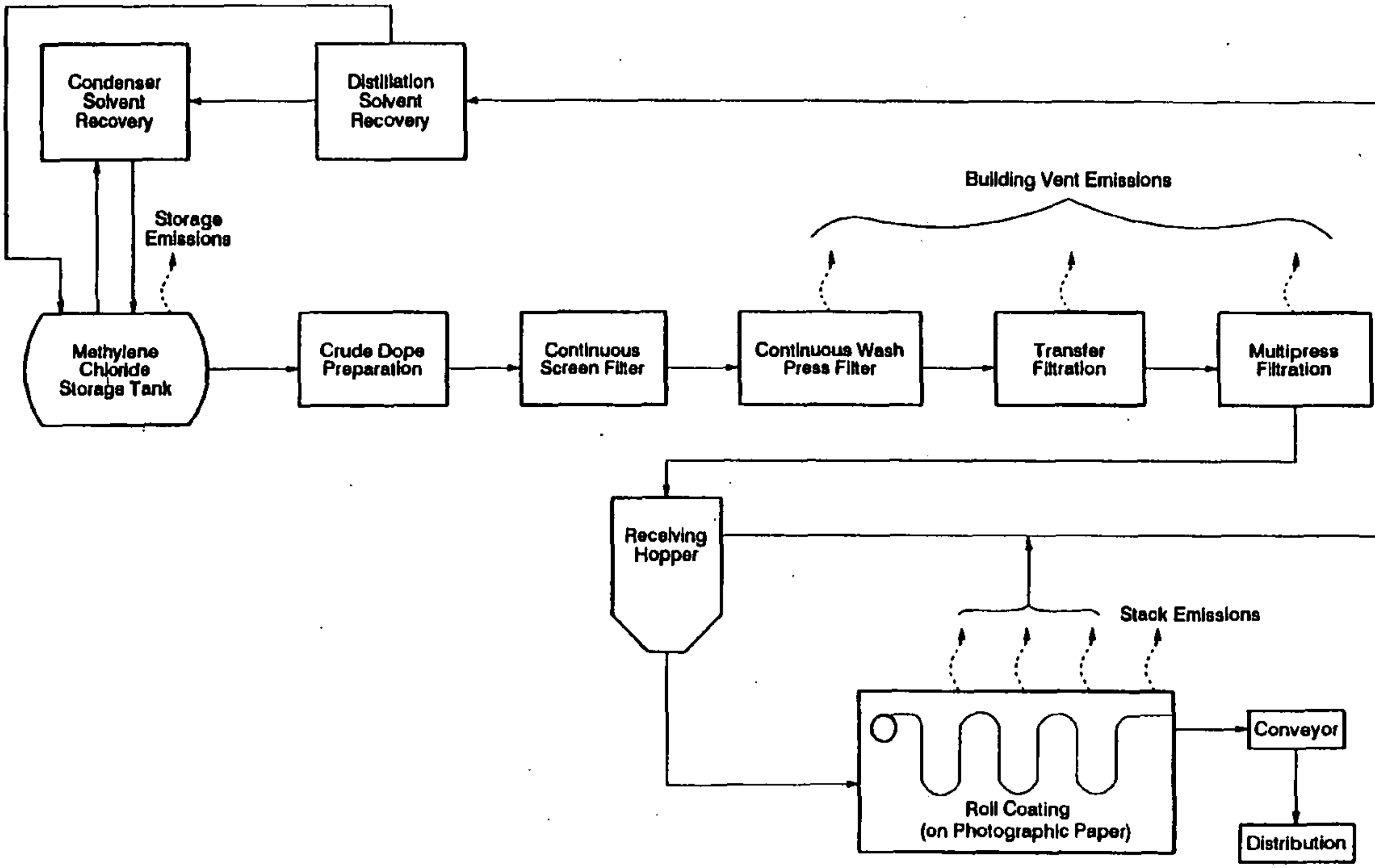

Figure 18. Photographic film process with MC emission sources.

Emissions--

Emissions from the manufacture of cellulose triacetate-based film can result from three basic stages of production: dope preparation, roll coating, and distillation or recycling. Numerous emission sources have been identified, but data have only been released for the most significant sources.

Dope production is the process of dissolving cellulose triacetate pellets. This is generally initiated by use of continuous mixers; however, batch mixers may be occasionally used. Emissions can be significant when these pellets are introduced to the mixing chamber during batch mixing. Current emission estimates for this activity are not available because the frequency of batch mixing has decreased markedly in recent years. Two other significant emission points in the dope production phase occur when filters for the continuous wash, transfer, and multipress filtration units are changed.[9,13] This process occurs approximately twice per day for each unit. The filters are removed from a cylindrical housing and allowed to evaporate. Emissions from this process have been estimated to be higher than all other dope production sources.

All other sources of MC emissions from dope production are associated with storage tanks and general building ventilation. The largest of these points are from "floor sweeps." These are ducted vents located near the filter housings that exhaust MC that accumulates near the floor.

Emissions from the roll coating machine represent over 90 percent of the emissions at a typical facility. During solvent evaporation of the film base web, local exhaust ventilation transports vapors to distillation and condenser recovery systems. This system recovers approximately 95 percent of the MC vapors in the process. The remaining 5 percent are released into the building, which has a ventilation design to rapidly move vapors from the floor and out of the building through vents or stacks. Large volumes of MC and the high temperatures at which the system operates account for the high level of emissions relative to other process functions. The building ventilation system, which serves primarily as a method to reduce workers' exposures, may also contribute to the building emissions.[9]

The other major process function in the manufacture of cellulose triacetate film is the distillation of recovered vapors. The major point of emissions from this source are likely to be storage tanks associated with the process.

Control technologies at the Kodak Rochester facility have included carbon adsorbers, scrubbers, condensers and vapor return. The exact locations of many of these controls have not been released. However, several control methods are used to recover MC. Carbon adsorbers have been applied at the roll coating machines exhaust air and building openings. Scrubbers have been applied in the solvent recovery systems. Reliable estimates of control efficiencies for these systems are not available. Other controls for fugitive emissions have included the selection of new valves with tighter seals and an increase in inspection and maintenance of existing potential process leaks. The pending OSHA regulations may significantly affect the type of controls that may be implemented.

Paints and Coatings

The paint and coatings industry encompasses a wide variety of products with many different end uses. A paint or coating is defined as a "liquid, liquefiable, or mastic composition that is converted to a solid, protective, decorative or functional adherent film by the application of a thin layer."[10]

Paints and coatings are produced by an estimated 390 facilities that consume 12,700 Mg of MC annually.[11] Paint and surface coatings are formulated by mixing three elements: synthetic polymer resins, which act as a binding agent, a dispersion medium (water or a volatile solvent), and pigments. Methylene chloride may be used in some products as a cosolvent in the dispersion medium to promote faster drying and dissolve binders during application. The main ingredients used in solvent-based paints are mineral spirits or petroleum naphtha products. Because MC reacts with dried paints on previously painted surfaces, its composition in paints is relatively low -- one or two percent by weight.[11]

For paints and coating products, recent emphasis on production of low-VOC products may increase the demand for additional MC use as a cosolvent because MC may be exempted from regulation as a VOC under state regulations implementing the national ambient air quality standard for ozone.[12] The impact of these regulations, however, is highly speculative at this time.

Methylene chloride emissions data for paints and coatings formulation and use was not found.

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SECTION 6
SOURCE TEST PROCEDURES

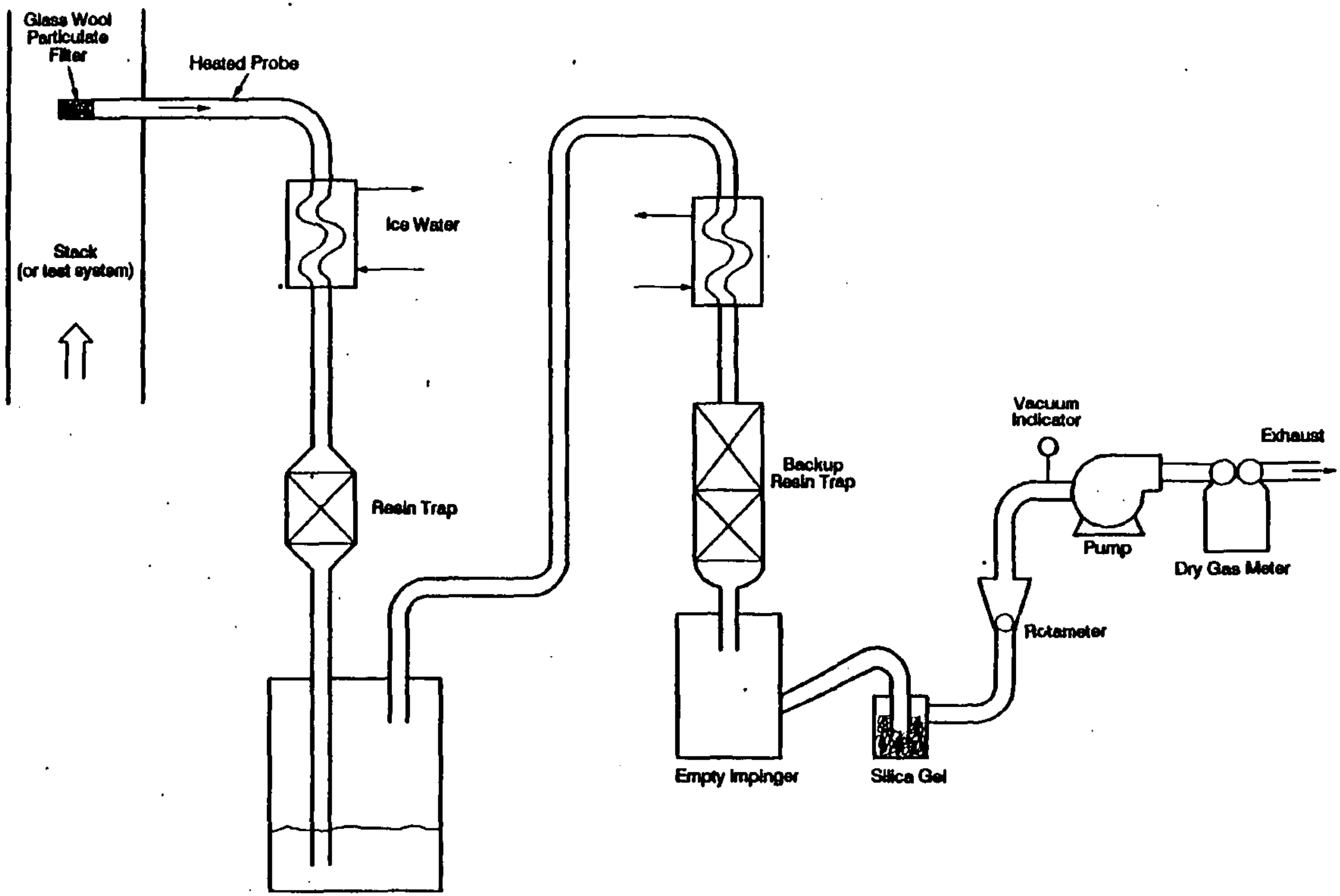
Methylene chloride emissions can be measured by a combination of the following methods:[1] (1) EPA Method 0030; (2) EPA Method 5040; (3) EPA Method 5041; (4) EPA Method 18; (5) Compendium Method TO-1; (6) Compendium Method TO-2; (7) Compendium Method TO-14; and (8) NIOSH Method 1005. Each of these methods is discussed in the following paragraphs.

EPA METHOD 0030

EPA Method 0030, which was published in EPA Report No. SW-846[2] in November, 1986, is a sampling method used to determine the destruction and removal efficiency (DRE) of volatile principal organic hazardous constituents (POHCs) from stack gas effluents from stationary sources. EPA Method 0030 is used for sampling MC emissions from stack gas effluents.[1] This methodology is applicable for sampling volatile constituents with boiling points between 35°C and 100°C; the boiling point of MC is within this range.

In Method 0030, a sample of effluent gas is withdrawn from an emission source using a glass-lined probe and a volatile organic sampling train (VOST). The gas stream is cooled through a water-cooled condenser and volatile POHCs are collected on a pair of sorbent resin traps, the first containing Tenax® and the second containing Tenax® and petroleum-based charcoal. Liquid condensate is collected in an impinger placed between the two resin traps. A schematic diagram of the VOST system is shown in Figure 19.

The sensitivity of this method depends on the level of interferences in the sample and the presence of detectable levels of volatile POHCs (in this case, MC) in the blanks. Interferences can arise from contamination of sorbent traps prior to or after use in sample collection.[3] Exposure of the sorbent materials to solvent vapors prior to assembly can be one source of interferences. Because MC is a common field recovery solvent, laboratory solvent, and laboratory air contaminant, contamination of the sorbent traps from these sources can also be a problem. Exposure to significant concentrations of volatile POHCs such as MC in the ambient air at chemical plants and other sources previously discussed is another



Source: Reference 2

Figure 19. Schematic of volatile organic sampling train (VOST).

potential interference. A sufficiently high background level in the source can make it impossible to determine trace quantities in the samples.

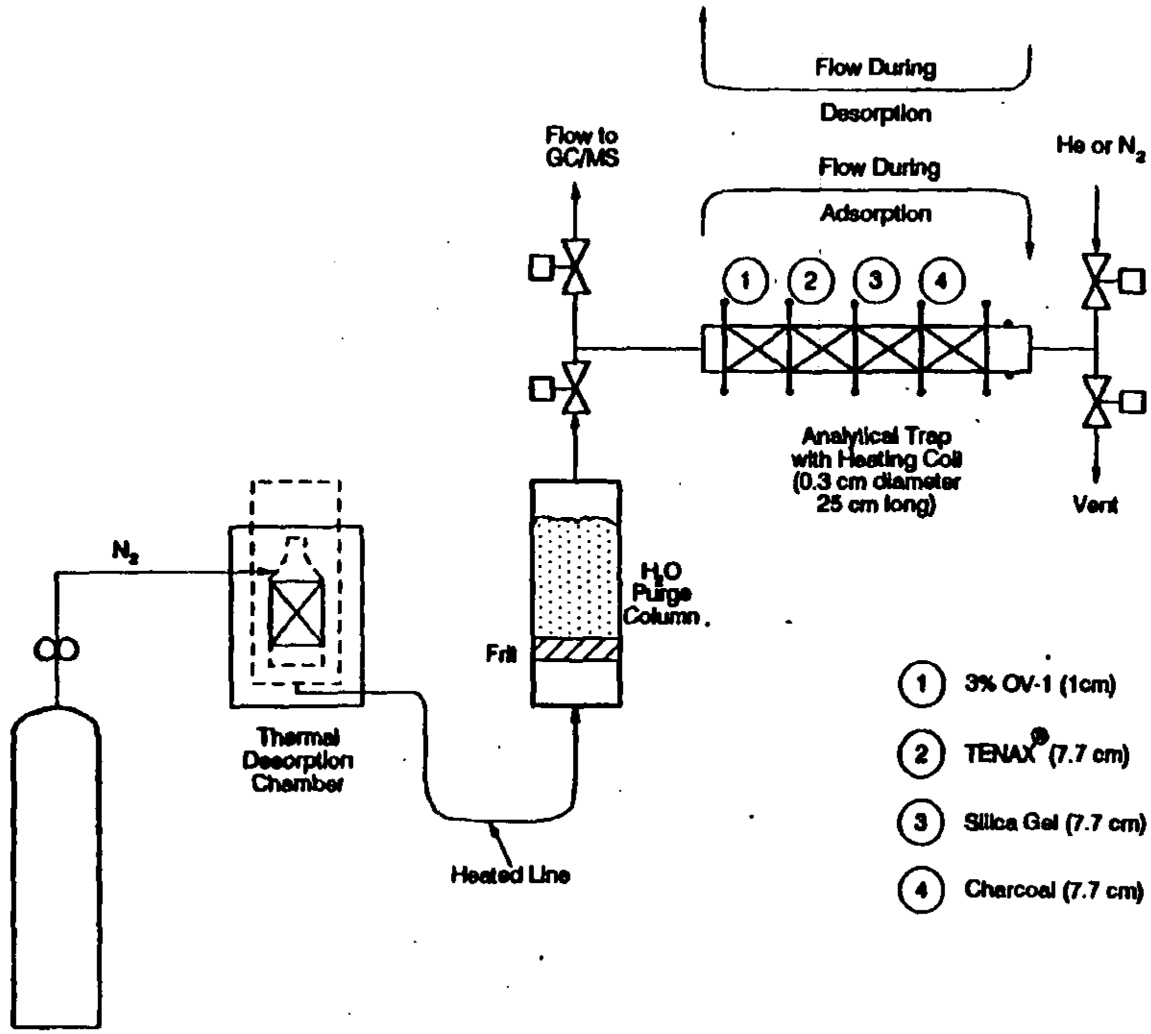
EPA METHODS 5040 AND 5041

EPA Methods 5040 and 5041 are both used to analyze POHCs collected from stack gas effluents of stationary sources. Method 5040 was published in the November 1986 Report No. SW-846.[2] Methods 5040 and 5041 are the primary analytical methods for determining the concentration of MC in stack emissions sampled using the VOST Method, EPA Method 0030.[1] The combination of Methods 0030/5040 or 5041 is intended for trace levels of organic compounds in emissions (i.e., ppb, low ppm). If the concentration in the source is hundreds of ppm or percentage levels, these methods are not appropriate. Because the majority of gas streams sampled using VOST will contain a high concentration of water, the analytical method is based on the quantitative thermal desorption of volatile POHCs from the Tenax® and Tenax®/charcoal traps. Purge-and-trap gas chromatography/mass spectrometry (GC/MS) is used to perform the analysis. The major difference between Methods 5040 and 5041 is the analytical column required. In Method 5040, a packed glass column is used; a Megabore® capillary column is used in Method 5041.

A schematic diagram of the analytical system is shown in Figure 20. The sorbent cartridges are spiked with internal standards and surrogates, thermally desorbed, and the VOCs are trapped on an analytical adsorbent trap directed into the GC/MS. The volatile POHCs are separated by temperature-programmed GC and detected by low-resolution MS.

The concentrations of volatile POHCs are calculated using the internal standard technique. Sample trains obtained from the VOST should be analyzed within two to six weeks of sample collection. The desired target detection limit of these methods is 0.1 nanogram per liter (ng/ℓ) (20 ng on a single pair of traps).

As with VOST sampling, solvent contamination can occur with analysis. Therefore, appropriate use of laboratory and field blanks is crucial for obtaining accurate quantitative values. Other concerns that may need to be addressed when using Methods 5040 and 5041 include



Source: Reference 3

Figure 20. Schematic diagram of trap desorption/analysis system.

saturation of the sampling cartridges with the analyte (MC) or other compounds found in the stack gas emissions, and background interferences during analysis.

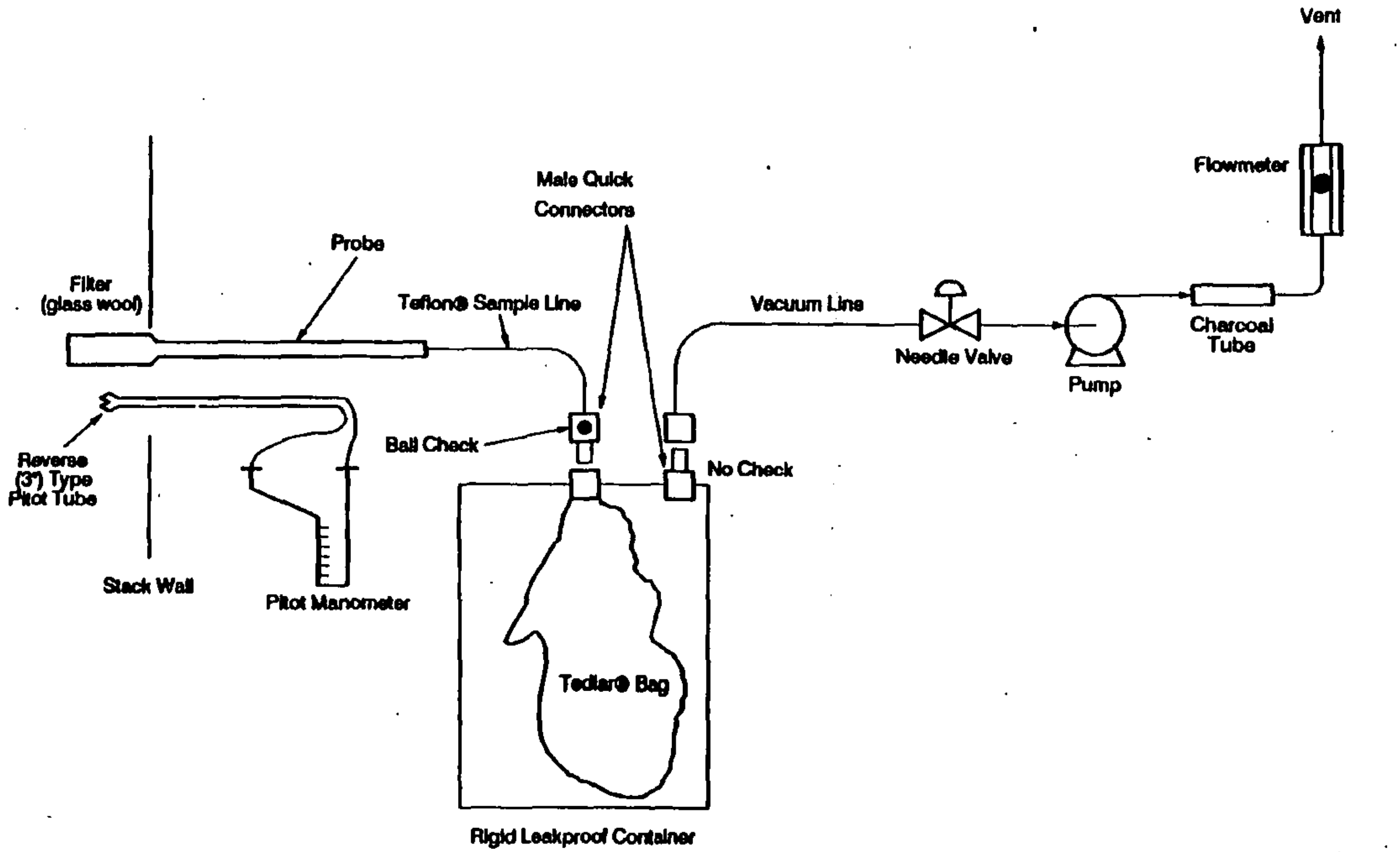
Interferences occur when something impairs the analyst's ability to make an accurate determination. In the case of a chromatographic method, this impairment is usually due to the presence of coeluting peaks that may arise from contamination of the sampling medium (sorbents). However, major sources of interference are constituents of the background during sampling. Many sources have a moderate to high background of hydrocarbons, some of which may coelute with MC and which may have common mass spectral ions. Other constituents of the source background may also provide chromatographic and mass spectral interference that will impair the ability of the analyst to perform an accurate determination.[4]

EPA METHOD 18

EPA Method 18 was announced in the Federal Register on October 18, 1983, and is published in Appendix A of 40 CFR Part 60.[5] It applies to the sampling and analysis of approximately 90 percent of the total gaseous organics emitted from an industrial source.[1] Method 18 is an alternative sampling and analytical method for VOCs (including MC). It can be used for single analytes or for a small number of multiple analytes. Method 0030, combined with Methods 5040 or 5041, has a broader application to a wider range of analytes and may, therefore, be preferred if there is a need to analyze for many organics. Method 18 has been used extensively for testing emissions from the chemical industry and other source categories emitting VOC.

In Method 18, a sample of the exhaust gas to be analyzed is drawn into a Tedlar® or aluminized Mylar® bag, as shown in Figure 21.[5] The bag is placed inside a rigid, leakproof container and evacuated. The bag is then connected by a Teflon® sampling line to a sampling probe (stainless steel, Pyrex® glass,or Teflon®) at the center of the stack. The sample is drawn into the bag by pumping air out of the rigid container.

The sample is then analyzed by GC coupled with flame ionization detection (FID). Based on field and laboratory studies, the recommended time limit for analysis is within 30 days of sample



Source: Reference 5

Figure 21. Intergrated bag sampling train.

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collection.[3] The GC operator should select the column and GC conditions that provide good resolution and minimum analysis time for MC. Zero grade helium or nitrogen should be used as the carrier gas at a flow rate that optimizes the chromatographic resolution.

The peak areas corresponding to the retention times of MC are measured and compared to peak areas for a set of standard gas mixtures to determine the MC concentrations. The detection limit of this method ranges from about 1 part per million (ppm) to an upper limit governed by the FID saturation or column overloading. However, the upper limit can be extended by diluting the stack gases with the inert gas or by using smaller gas sampling loops.

When access to the sampling location is difficult, an alternative sampling method described in Section 7.4 of EPA Method 18 may be preferred.[3]

COMPENDIUM METHODS TO-1, TO-2, AND TO-14

Compendium Methods TO-1, TO-2, and TO-14 are sampling and analytical methods used to determine VOCs such as MC in ambient air, and can be found in the "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air."[6] These methods are not appropriate for source monitoring.[1]

Method TO-1

Method TO-1 is used to collect and determine volatile, non-polar organics that can be captured on Tenax® and determined by thermal desorption techniques. In this method, air is drawn through a cartridge containing 1-2 g of Tenax®. The cartridge is analyzed in the laboratory for MC and purged with an inert gas into a GC/MS system. Only capillary GC techniques should be used. The GC temperature is increased through a temperature program and the compounds are eluted from the column on the basis of boiling points. The MS identifies and quantifies the compounds by mass fragmentation patterns. Compound identification is normally accomplished using a library search routine on the basis of GC retention time and mass spectral characteristics.

Method TO-2

In Method TO-2, air is drawn through a cartridge containing 0.4 g of a carbon molecular sieve (CMS) adsorbent. The cartridge is analyzed in the laboratory by flushing with dry air to remove adsorbed moisture and purging the sample with helium while heating the cartridge to 350-400°C. The desorbed organics (such as MC) are collected in a cryogenic trap and flash-evaporated into a GC/MS system. Only capillary GC techniques should be used. The GC temperature is increased through a temperature program and the compounds are eluted from the column on the basis of boiling points. The MS identifies and quantifies the compounds by mass fragmentation patterns. Compound identification of MC is normally accomplished using a library search routine on the basis of GC retention time and mass spectral characteristics.

Method TO-14

Method TO-14 is based on the collection of whole air samples in SUMMA® passivated stainless steel canisters for analysis of VOCs (MC) in ambient air. A sample of ambient air is drawn through a sampling train of components that regulate the rate and duration of sampling into a pre-evacuated SUMMA® passivated canister. The canister is attached to the analytical system. Water vapor may be reduced in the gas stream by a Nafion® dryer and VOCs are concentrated by collection into a cryogenically-cooled trap. The cryogen is removed and the temperature of the sample raised to volatilize the sample into a high-resolution GC. The GC temperature is increased through a temperature program and the compounds are eluted from the column on the basis of boiling points into a detector.

The choice of detector depends on the specificity and sensitivity required by the analysis. Gas chromatography ultimately relies on retention time for identification of compounds. In many cases, this use of retention time is enhanced by the information from a selective gas chromatographic detector. However, it cannot be determined from GC alone whether coelution of compounds is occurring, or whether a particular peak represents a particular compound. When mass spectrometry is used as the detector, a mass spectrum can provide compound-specific information and can show whether other compounds are present at a given retention time.[4]

In Method TO-14, a capillary column with methyl silicone coating, or equivalent is specified for detecting MC.[6] A wider Megabore® column can be used as long as the system meets user needs. Compounds have been successfully measured at the parts per billion by volume (ppbv) level using this method.

NIOSH METHOD 1005

The NIOSH methods are used to measure ambient air in workplace environments. NIOSH Method 1005, which was published in the 1985 "NIOSH Manual of Analytical Methods", is used to measure MC in the workplace.[7]

In NIOSH Method 1005, air samples are collected with solid sorbent tubes containing coconut shell charcoal. A personal sampling pump is used to collect 1.5 - 2.5-ℓ air samples at a flow rate of 0.01 to 0.2 ℓ/min. Samples are desorbed with carbon disulfide and analyzed by GC equipped with an FID. The column specified in NIOSH Method 1005 is a 3.0 m x 3 mm stainless steel, 10% SP-1000 on 80/100 mesh Chromosorb® W-HP, or equivalent.[7] The amount of MC in a sample is obtained from the calibration curve in units of milligrams per sample. The working range of NIOSH Method 1005 is 100 to 3000 ppm for a 1-ℓ air sample. The method is applicable to ceiling determinations.

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APPENDIX A

EXAMPLE PROCEDURES TO ESTIMATE METHYLENE CHLORIDE EMISSIONS

The purpose of this appendix is to present general example equations or calculation procedures and assumptions that may be used to estimate methylene chloride (MC) air emissions from differing sources. This appendix describes estimation procedures for three types of emission sources: (1) storage; (2) equipment leaks; and (3) secondary sources (wastewater).

The following sections describe example estimation procedures for emission sources.

SECTION 1 - STORAGE EXAMPLE

The following storage loss equations are presented for estimating fixed-roof breathing loss and fixed-roof working losses for a vertical tank storing methylene chloride. The following example equations are from the EPA Publication No. AP-42 emission factors for storage of organic liquids, Supplement E.[1] The purpose of their presentation is to alert the reader to the site-specific and chemical property considerations that are required for the estimation of MC emissions from storage. The equations presented are based on the following general points:

- Equations are for estimating standing storage and working losses for a vertical, fixed-roof storage tank.[1]
- Storage tank emissions from loading and unloading MC are accounted for in the working loss equation.

Example Equations

For a vertical, fixed-roof storage tank the following equations apply:[1]

$$L_T = L_S + L_W$$

where: $L_S = 365\ W_V V_V K_E K_S$

$L_W = 0.0010\ M_V P_{VA} Q K_N K_P$

L_T = total loss, lb/yr

L_S = standing storage loss, lb/yr

L_W = working loss, lb/yr

V_V = tank vapor space volume, ft^3

$$V_V = \frac{\Pi}{4\,D^2\,H_{VO}}$$

W_V = vapor density, lb/ft^3

$$W_V = \frac{M_V\,P\ VA}{RT_{LA}}$$

K_E = vapor space expansion factor, dimensionless

$$K_E = \frac{\Delta T_V}{T_{LA}} + \frac{\Delta P_V - \Delta P_B}{P_A - P_{VA}}$$

K_S = vented vapor space saturation factor, dimensionless

$$K_S = \frac{1}{1 + 0.053\, P_{VA} H_{VO}}$$

D = diameter, ft

H_{VO} = vapor space outage, ft

M_V = molecular weight of vapor, lb/lb-mole

P_{VA} = vapor pressure at the daily average liquid surface temperature, psia

T_{LA} = daily average liquid surface temperature, °R

ΔT_V = daily vapor temperature range, °R

ΔP_V = daily vapor pressure range, psia

ΔP_B = breather vent pressure setting range, psi

P_A = atmospheric pressure, psia

Q = annual net throughput, lb/yr

K_N = working loss turnover factor, dimensionless

K_P = working loss product factor, dimensionless

Applicability Considerations:

- Equations and tables that further define these equation variables are presented in Supplement E of AP-42, "Storage of Organic Liquids."
- Emissions from horizontal tanks can be calculated by making adjustments to parameters in the fixed-roof equations. There are step-wise examples regarding how to proceed with adjustments in Supplement E of AP-42, "Storage of Organic Liquids."
- Supplement E also supplies the vapor pressure equation constants, molecular weight, boiling point at 1 atmosphere, liquid density at 60°F, and vapor pressure at varying temperatures for a variety of compounds (including MC).

SECTION 2 - EQUIPMENT LEAKS EXAMPLE

The following equipment leaks example is presented for estimating equipment leaks emissions based on VOC emission factors. This example presents the simplest of five methods delineated in the "Protocols" document, and should only be employed when other data are not available.[2] The purpose of its presentation is to alert the reader to the site-specific and chemical property considerations that are required for the estimation of MC emissions from equipment leaks. The estimation methodology is based on the following general points:

- Annual emission rates from equipment leaks in this example are based on the VOC emission factors (kg of VOC/hr) presented in Table A-1.[2]
- In applying the emission factors to equipment leaks, MC can be considered as a light liquid VOC because its vapor pressure is greater than 0.3 kPa. It can be assumed that MC is emitted like other VOC compounds.
- The annual MC emission rate from each equipment component type is the product of the appropriate emission factor, the percent MC handled by the equipment component, the maximum number of hours the equipment handles MC-laden material, and the number of equipment components that come in contact with the MC. The emission rates for each type of equipment component (i.e., pump seals, compressor seals, flanges, etc.) are summed to obtain a total equipment leak emission rate for each facility.

<u>Sample Calculation</u>

<u>Example Site-Specific Information</u>

- Three mechanical pump seals between mixing tank and filling lines. All are within a building.

  3 lines - 3 pump seals

- Hours of handling

  3 lines - 8 hr/day, 5 day/wk

- Amount of MC consumed = 496,944 lb/yr. Includes consumption for products and line flush.
- Amount of MC-based products packaged = 2,828,797 lb/yr

TABLE A-1. AVERAGE EMISSION FACTORS FOR PROCESS EQUIPMENT COMPONENTS USED TO ESTIMATE VOC EMISSIONS FROM EQUIPMENT LEAKS

Equipment Component (Emission Source)	Emission Factor[a,b] (kg VOC/hr-component)
Pumps - Liquid[b]	0.494
Compressors	0.228
Flanges	0.00083
Valves - Gas	0.0056
- Liquid[b]	0.0071
- Heavy Liquid	0.00023
Sampling Connections	0.0150
Open-Ended Lines	0.0017

[a] Emission factors were developed for VOC emitted from equipment components used in the synthetic chemical manufacturing industry (SOCMI).

[b] Liquid refers to light liquid and is defined as a petroleum liquid with a vapor pressure greater than the vapor pressure of kerosene.

Source: Reference 2.

Calculations

1. Hours of Handling = 8 hr/day · 5 day/wk · 52 wk/yr = 2,080 hr/yr
--assumes 52 wk/yr

2. Percent MC handled by the equipment components

$$\frac{496{,}944 \text{ lb MC/yr}}{2{,}828{,}797 \text{ lb MC-based product/yr}} \cdot 100 = 17.6 \text{ weight-percent}$$

- assumes the amount of MC used for cleanup and line flush is handled by the same component
- assumes concentration of MC is similar for all lines

3. Number of and emission factors for equipment components.

Number and type of equipment component = three mechanical pump seals.
Emission factor for pump seals = 0.494 kg MC/hr

4. Annual MC Emission Rate = $\text{Number of Components} \cdot \text{Weight-percent of MC Handled}$

$\cdot$ Hours of Handling $\cdot$ Emission Factor

$$= (3)\ (0.176)\ (2{,}080 \text{ hr/yr})\ (0.0494 \text{ kg MC/hr}) \cdot \frac{1 \text{ Mg}}{1{,}000 \text{ kg}}$$

$= 0.05$ Mg MC/yr

SECTION 3 - SECONDARY WASTE STREAM EXAMPLE

The following secondary waste stream wastewater example calculation is presented as an example method for the estimation of MC emissions from wastewater streams. For a more detailed and accurate estimation methodology for MC emissions from wastewater streams, the reader is referred to the "Industrial Wastewater Volatile Organic Compound Emissions -- Background Information for Proposed Standards" document.[3] The purpose of this presentation is to alert the reader to some of the site-specific considerations required for the estimation of MC emissions from wastewater streams.

Example Method

- Secondary waste streams include wastewater streams, and organic-liquid or solid wastes.

- Emissions from wastewater streams can be calculated from the MC concentration, and the daily influent wastewater flowrate. In order to develop maximum emission estimates, it could be assumed that all of the MC in the wastewater is released to the atmosphere. In this example, it is assumed wastewater is generated 260 days per year.

$$\underset{[\text{Mg MC/yr}]}{\text{MC Emission Rate}} = \frac{\underset{\text{or Storage [gal/day]}}{\overset{\text{Influent Wastewater}}{\text{Flowrate to Treatment}}} \cdot \underset{[\mu\text{g MC}/\ell]}{\overset{\text{Influent}}{\text{Concentration}}} \cdot [3.79\ \ell/\text{gal}]}{\dfrac{10^{12}\ \mu\text{g}}{1\ \text{Mg}} \cdot \dfrac{\text{yr}}{260\ \text{day}}}$$

- Emissions from organic-liquid or solid wastes can be calculated from the daily volume of waste generated and the weight percent of MC.

$$\begin{array}{c}\text{Emission Rate}\\ \text{[Mg MC/Yr]}\\ \text{from Liquid or}\\ \text{Solid Wastes}\end{array} = \underset{\text{[gal/day]}}{\text{Daily Volume}} \cdot \underset{\text{[Mg/gal]}}{\text{Density MC}} \cdot \frac{260\ \text{days}}{\text{yr}} \cdot \underset{\text{(wt-percent)}}{\text{MC Composition}}$$

REFERENCES

1. Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fourth Edition, AP-42, Supplement E, U.S. Environmental Protection Agency, Research Triangle Park, NC.

2. Protocols for Generating Unit-Specific Emission Estimates for Equipment Leaks of VOC and VHAP, EPA-450/3-88-010, U.S. Environmental Protection Agency, Research Triangle Park, NC, 1988.

3. Industrial Wastewater Volatile Organic Compound Emissions -- Background Information for BACT/LAER Determinations, EPA-450/3-90-004, March 1990, Chapter 4.

APPENDIX B

NATIONAL LIST OF PAINT STRIPPER FORMULATORS (JULY 1987)

NATIONAL LIST OF PAINT STRIPPER FORMULATORS (JULY 1987)

Company Name	Location
Alvin Products, Inc.	Worcester, MA
Amchem Products	Ambler, PA
American Niagara Corp.	Atlanta, GA
Ashland Chemical Co.	Columbus, OH
A-Z Midwest Factory Supply	Addison, IL
Beaver Alkali Products	Rochester, PA
Beck Chemicals, Inc.	Cleveland, OH
Behlen, H. & Bros., Inc.	Amsterdam, NY
Benco	Fontana, CA
Benco	Crossville, TN
Besway Chemical Systems, Inc.	Madison, TN
Cedtex Chemical	Southfield, MI
Certified Coating Pdts., Inc.	Los Angeles, CA
Chemclean Corporation	College Point, NY
Chemical Products Co., Inc.	Aberdeen, MD
Chemical Systems Research	West Bloomfield, MI
Consolidated Chemical	St. Louis, MO
Dap, Inc.	Tipp City, OH
Day, James B., & Co.	Carpentersville, IL
Delta Foremost Chemical Corp.	Memphis, TN
Diversey Wyandotte Corp.	Wyandotte, MI
Dober Chemical Corp.	Midlothian, IL
Dynaloy, Inc.	Hanover, NJ
Dytex Chemical Co., Inc.	Central Falls, RI
Ecco Chemicals, Inc.	Dallas, TX
Eldorado Chemicals	San Antonio, TX
Ensign Products	Cleveland, OH
Enterprise Co.	Wheeling, IL
Excelda Mfg. Co.	Ferndale, MI
Excelsior Varnish	Cleveland, OH
EZE Products	Greenville, SC

NATIONAL LIST OF PAINT STRIPPER FORMULATORS (JULY 1987) (Continued)

Company Name	Location
Formby's Inc.	Olive Branch, MS
FPNS	Henderson, KY
Fuller-O'Brien Paints	South San Francisco, CA
Gage Products	Ferndale, MI
Goodrich Products	Highlands, TX
Grow Group, Inc.	Detroit, MI
Grow Group, 2 (Nat'l Aerosol Pdts)	Los Angeles, CA
Harley Chemicals	Camden, NJ
Hexcel Chemicals	Lodi, NJ
Higley Chemicals	Dubuque, IA
Hillyard Chemicals	St. Joseph, MO
International Chemicals	Philadelphia, PA
International Paints	Union, NJ
International Paints	Houston, TX
Isochem Products	Lincoln, RI
J & S Chemicals	Macedonia, OH
Jasco Chemicals	Mountain View, CA
KCI Chemicals	La Porte, IN
Kerns United	Calumet City, IL
Key Chemicals	Philadelphia, PA
Klean Strip	Memphis, TN
Kwick Kleen Industries	Vincennes, IN
London Chemicals	Bensenville, IL
Lowe Brothers Co.	Cleveland, OH
Madison Bionics	Oak Brook, IL
Magnuson Products	Clifton, NJ
Man-Gill Co.	Cleveland, OH
Mantrose-Hauser Company	Attleboro, MA
McGean Rohco Inc.	Los Angeles, CA
Midland Lab	Des Moines, IA
Mitchell-Bradford Chemicals	Milford, CT

NATIONAL LIST OF PAINT STRIPPER FORMULATORS (JULY 1987)
(Continued)

Company Name	Location
National Solvent Corp.	Medina, OH
NCH Corp.	Irving, TX
Nuvite Chemicals	Brooklyn, NY
Oakite Products	Metuchen, NJ
Oakite Products	City of Industry, CA
Oakite Products	Romulus, MI
Oakite Products	Houston, TX
Oxford Chemicals	Atlanta, GA
Par-Chem Products	Houston, TX
PBNS	Henderson, KY
Penetone Corporation	Tenafly, NJ
Pennwalt Corporation	Carson, CA
Pennwalt Corporation	Marion, OH
Petrocon Marine & Ind.	Brooklyn, NY
Pioneer Chemicals	West Point, OH
Prillaman Company	Martinsville, VA
Product-Sol Inc.	Birmingham, MI
Proko Industries	Dallas, TX
PyRock Chemicals	Long Island City, NY
Rap Products	Bay City, MI
Red Devil Paints	Mount Vernon, NY
Reliable Paste and Chemicals	Chicago, IL
Reliable Remover and Lacquer	Irvington, NJ
Savogran Company	Norwood, MA
Savogran Company	Addison, IL
Savogran Company	Los Angeles, CA
Sermac Industries	Altoona, PA
Sheldahl	Northfield, MN
Sherwin-Williams	Richmond, KY
Sherwin-Williams	Chicago, IL
Staples, H.F.	Merrimack, NH

NATIONAL LIST OF PAINT STRIPPER FORMULATORS (JULY 1987) (Concluded)

Company Name	Location
Star Bronze	Alliance, OH
Sterling-Clark-Lurton	Malden, MA
Strip-Tech	Hendersonville, TN
Stripping Products (BIX)	Old Hickory, TN
Stuart Radiator	Merced, CA
Sunshine Chemicals	West Hartford, CN
Texas Refinery	Fort Worth, TX
Texo Corp	Cincinnati, OH
Tower Chemicals	Palmer, PA
Tropical Industrial Coatings	Brunswick, OH
United Gilsonite	Scranton, PA
Urban Chemicals	Deerfield, IL
Watson-Standard	Harwick, PA
William M. Barr & Co.	Memphis, TN
Wilson-Imperial	Newark, NJ
Zep Manufacturing	Atlanta, GA

Source: Memorandum from E. Moretti, Radian Corporation, to the U.S. Environmental Protection Agency. Emission Estimates and Controls for Emissions from Paint Stripper Formulation Facilities (DRAFT). September 11, 1987.

APPENDIX C

NATIONAL LIST OF AEROSOL PACKAGERS

NATIONAL LIST OF AEROSOL PACKAGERS (JULY 1987)

	COMPANY	CITY	STATE	LATITUDE	LONGITUDE	PRODUCT CODE	REFERENCE
1	ACCRA PAC GROUP	ELKHARDT	IN	414100	855800	A,C,D,F,K	1,3,4
2	ADTECH DESIGN CO.	HORSHAM	PA	401100	750800	A,B,C,D,E,F,H,I	3
3	ADVANCE AEROSOL & CHEMICAL CO.	GENOA CITY	WI	423000	882000	A,C,D,E,F,K	3,6
4	AEROSOL RESEARCH LAB, INC.	HOLBROOK	MA	420900	710100	C,D,E,G	3
5	AEROSOL SERVICES CO., INC.	CITY OF INDUSTRY	CA	340200	1175600	A,B,C,D,G,H,K	3,4,5
6	AEROSOL SYSTEMS	MACEDONIA	OH	411900	•813100	A,C,D,E,F	3,9
7	AEROSOL WEST	VENTURA	CA	341700	1191800	A,C,D,E,H	3
8	AEROTECH INDUSTRIES	GARLAND	TX	333000	943700	A,D,F,K	3
9	AERO-KING, INC.	BRONX	NY	405100	735400	C,D,E	3
10	AERVOE PACIFIC CO.	SAN LEANDRO	CA	374400	1220900	A,D,F,K	4,9
11	AIROSOL CO., INC.	NEODESHA	KS	372500	954100	A,D,C,E,G,I,K	3
12	ALTAWOOD INC.	GARDENA	CA	335300	1181800		5
13	AMERICAN AEROSOLS	HOLLAND	MI	424700	860700	A,D	3
14	AMERICAN NIAGARA CORP.	ATLANTA	GA	334500	842300		6
15	AMREP, INC.	MARIETTA	GA	335700	843300	A,C,D,E,K	3,6,9
16	AMWAY CORP.	ADA	MI	425900	853000		5
17	APOLLO INDUSTRIES, INC.	SMYRNA	GA	335300	843100		5
18	ATI, INC-1	TOTOWA	NJ	405400	741300		1,9
19	ATI, INC-2 (ARMSTRONG LABORATORIES DIV.)	WEST ROXBURY	MA	421700	710900	C,D,E,G,H	2,3,9
20	BARR CO.	NILES	IL	420200	874800	A,C,D,G,I	2,9
21	BARRETT CHEMICAL CO.	PHILADELPHIA	PA	395700	751000	A,D	3
22	BEECHAM HOME IMPROVEMENT	CLIFTON	NJ	405200	740900		5
23	BISSELL-1 (PENN CHAMP, INC)	EAST BUTLER	PA	405300	795100	A,C,G	8
24	BISSELL-2 (PENN CHAMP, INC)	RIVERSIDE	CA	335900	1172200	A,C,G	3,4
25	BORDEN (KRYLON DEPARTMENT)	COLUMBUS	OH	395800	830000	F	7
26	BOXAL METALS, INC.	FAIRLAWN	NJ	405600	740800		4
27	BOYLE-MIDWAY (AMERICAN HOME PRODUCTS)	CRANFORD	NJ	404000	741800		5,6
28	BRISTOL-MEYERS-1 (CLAIROL)	NEW YORK	NY	404500	735700	G	5
29	BRISTOL-MEYERS-2 (LENK CO.)	FRANKLIN	KY	364300	863500		1,9
30	BROUGHTON FOODS CO.	MARIETTA	OH	392500	812700		5
31	B&B AEROSOL PACKAGING CO., INC.	CHICAGO	IL	415200	873900	A,C,D,E,F,G,K	3
32	CAMIE-CAMPBELL, INC.	ST. LOUIS	MO	383700	901200		6,9
33	CARE LABORATORIES, INC.	COLLEGEVILLE	PA	401100	752800	A,D,E,F	3
34	CARSON CHEMICALS, INC.	NEW CASTLE	IN	395500	852200		5
35	CARTER-WALLACE, INC.	CRANBURY	NJ	401900	743100		5
36	CASE-MASON FILLING, INC.	JOPPA	MD	392600	762200	C,D,G,H,K	1,9
37	CHAMPION LABS (PYROIL CO.)	ALBION	IL	382100	880400	A,D	1,5
38	CHASE PRODUCTS CO	MAYWOOD	IL	415300	875100		4,9
39	CHEM TECH, INC	WILMINGTON	DE	394500	753100	A,D	5

NATIONAL LIST OF AEROSOL PACKAGERS (JULY 1987)

	COMPANY	CITY	STATE	LATITUDE	LONGITUDE	PRODUCT CODE	REFERENCE
40	CHEMSCOPE CORP.	ARLINGTON	TX	324400	970700	A,B,D,F	3,9
41	CHEMSICO, INC.	ST. LOUIS	MO	383700	901200	A,C,D,E,F,I	3,9
42	CHEMSPRAY, INC.	TOTOWA	NJ	405400	741300	A,C,D,G,H,I K	3
43	CHEMTRONICS	HAUPPAGE	NY	405000	731200	A,D,E,G,H	3,9
44	CHEM-PACKAGING CORP.	POMPANO BEACH	FL	261400	800800	A,C,D,E	3
45	CHEM-PAK, INC.	WINCHESTER	VA	391100	781000	A,B,D,F	3,6,9
46	CHEM-TECH, LTD.	DES MOINES	IA	413500	933700	E,I	3
47	CHESEBROUGH-PONDS, INC.	GREENWICH	CT				5
48	CLAPP INDUSTRIES CORP.	POTOMAC	IL	401800	874800	A,B,C,D,G,K	3
49	CLAYSON, INC. (GEM, INC.)	BYHALIA	MS	345200	894100	C,D,G	1,3,8,9
50	CLINE-BUCKNER, INC.	ARTESIA	CA	235200	1180500	C,D,E	3
51	CONNECTICUT AEROSOLS, INC.	MILFORD	CT	411400	730400		3,9
52	CONTACT INDUSTRIES, INC.	ELIZABETH	NJ	404000	741300	A,C,D,E,F,G,H,I	3,4,9
53	CONTINENTAL LABORATORIES, INC.	MADRID	IA	415300	934900	A,C,D,E,G,H,I	3
54	CPC-1 (PETERSON/PURITAN, INC.)	CUMBERLAND	RI	415700	712500	C,G	6
55	CPC-2 (PETERSON/PURITAN, INC.)	DANVILLE	IL	400800	873700	A,B,C,D,E,G,H,I,K	4,6
56	CPC-3 (PETERSON/PURITAN, INC.)	ENGLEWOOD CLIFFS	NJ	405300	735700		6
57	CRC CHEMICALS	WARMINSTER	PA	401200	750600		6
58	CREATIVE PRODUCTS CORP.	NEW HAVEN	CT	411800	755500	A,B,C,D,G,H,K	3
59	CROWN INDUSTRIAL PRODUCTS CO.	HEBRON	IL	422800	882600	D,F	3,6,9
60	CUSTOM-PAK PRODUCTS, INC.	GERMANTOWN	WI	431400	880600	D,F	3,5
61	C.S.A. LIMITED, INC.	HOUSTON	TX	294600	952200	A,C,D,E,G I	3
62	DELCOR LABORATORIES, INC.	E. STROUDSBERG	PA	410000	751100	G,H	3
63	DEMERT & DOUGHERTY, INC.	OAK BROOK	IL	415100	875800	A,C,D,G,K	1,3,9
64	DESOTO, INC.	DES PLAINES	IL	420300	875200		5
65	DEVOE & RAYNOLDS	LOUISVILLE	KY	381500	854600		5
66	DYNON, INC.	KANSAS CITY	KS	390700	943800	A,D,E	3,5
67	EMBALMERS SUPPLY CO.	WESTPORT	CT	410900	732200		5
68	ENTERPRISE SALES CO.	LOS ANGELES	CA	340400	1181500	D,E,K	3
69	ESKA PACKAGING CORP.	LAKEWOOD	NJ	400600	741300	A,D,E	3
70	EVEREADY PRODUCTS CORP.	CLEVELAND	OH	413000	814200	A,C,D,F,K	3,5
71	E.J. MCKERNAN CO.	GARDEN GROVE	CA	334700	1175500		4,8
72	FASSE PAINT CO., INC.	SHEBOYGAN FALLS	WI	434200	874500	F	3
73	FAULTLESS STARCH (BON AMI CO.)	KANSAS CITY	MO	390600	943500		5
74	FLUID PACKAGING CO., INC	LAKEWOOD	NJ	400600	741300	C,H	4,9
75	FORREST PAINT CO	EUGENE	OR	440500	1230400		5
76	FRANK ORLANDI, INC	FLUSHING	NY	404500	734900	C,D,K	3
77	FRANKLIN OIL CORP (RICOL DIV)	CLEVELAND	OH	413000	814200	D	6,9
78	FULTON CO	SUMTER	SC	335500	802100	F	3

NATIONAL LIST OF AEROSOL PACKAGERS (JULY 1987)

	COMPANY	CITY	STATE	LATITUDE	LONGITUDE	PRODUCT CODE	REFERENCE
80	GEMINI AEROSOLS, INC.	EL RENO	OK	353200	975700	A,F,	3
81	GEMINI LACQUERS	BEVERLY	MA	423300	705300		5
82	GEM, INC.	BYHALIA	MS	345200	884100	C,D,G	3
83	GENERAL PAINT	CARY	IL	421300	881400		5
84	GEORGIA PACIFIC CORP.	ATLANTA	GA	334500	842300		5
85	GILETTE CO.	ANDOVER	MA	424000	710800		6
86	GLIDDEN PAINTS	CLEVELAND	OH	413000	814200		6
87	GROW GROUP-1 (CELLO CORP.)	SANTA FE SPRINGS	CA	335700	1180400		5
88	GROW GROUP-2 (NATIONAL AEROSOL PRODUCTS)	CERRITOS	CA	335200	1180500	A,C,D,E,F,G,I,K	2,7,9
89	GUARDSMAN (AMERICAN AEROSOL INC.)	HOLLAND	MI	424700	860700		1,3,5,9
90	GUEST PACKAGING	RAHWAY	NJ	403700	741600	C,G	3
91	HOLT LLOYD (LPS PRODUCTS)	TUCKER	GA	335100	841300	D	6,7
92	HOWARD JOHNSON	NORTH QUINCY	MA	421700	710100		5
93	HYDROSOL	BURR RIDGE	IL	414700	875500	A,C,D,E,F,K	3,5
94	HYSAN CORP.	CHICAGO	IL	415200	873900	A,C,D,E,F,G,K	3
95	IKI MFG. CO.	EDGERTON	WI	425000	890400	A,C,D,E,G,I,H,K	1,3,9
96	ILLINOIS BRONZE PAINT CO.	LAKE ZURICH	IL	411200	880500	A,D,F,K	1,3,9
97	JET-AER CORP.	PATERSON	NJ	405500	741100	A,C,D,E,I,K	4
98	JL MFG.	GRANBURY	TX	332700	974700		3
99	KNIGHT OIL CORP.	JOHNSTOWN	NY	430000	742200	A,C,D,F	3,9
100	KOHALRAD PRODUCTS, INC.	PANDORA	OH	405700	835800	A,C,D,F	3
101	LAMAUR COMPANY	MINNEAPOLIS	MN	445900	931600		6
102	LAWRENCE-MCFADDEN CO.	PHILADELPHIA	PA	395700	751000		7,9
103	LAWSON CHEMICAL PRODUCTS CO.	TORRANCE	CA	335000	1181900	A,D,E,F	3
104	MARCY LABS	ADDISON	IL	415600	875900	A,G,I,K	1,3,9
105	MBL INDUSTRIES, INC.	SANTA ANA	CA	334600	1175200	A,C,D,E,K	3
106	METROVAL, INC. (EPIC INDUSTRIES, INC.)	METUCHEN	NJ	403200	742200		5,9
107	MIDCO PRODUCTS, CO	MARYLAND HEIGHTS	MO	384300	902600	A,C,D,E,F,I	3,9
108	MOBILE PAINT	THEODORE	AL	303300	881000		5
109	MOHAWK FINISHING	AMSTERDAM	NY	424600	741100		5
110	MOHAWK LABORATORIES	IRVING	TX	324900	965600		5
111	MORTON PHARMACEUTICALS, INC.	MEMPHIS	TN	350800	900300	A,C,D,F,I	3,9
112	NATIONWIDE INDUSTRIES	PANDORA	OH	405700	835800		8
113	NEW ENGLAND AEROSOL & PACKAGING CORP.	WOBURN	MA	422900	710900	A,C,D,E,F,G,K,I	3,5
114	NEW YORK BRONZE-1	ELIZABETH	NJ	404000	741300		5,6
115	NEW YORK BRONZE-2	TAYLOR	PA	412200	754300	F	6
116	NORTHEAST PACKAGING INC.	ORANGE	CT	411700	730200	A,C,D,E,F,G,H	3
117	NOXELL, INC.	BALTIMORE	MD	391700	763700		5
118	OAKITE PRODUCTS-1 (CLAIRE MFG. CO.)	ADDISON	IL	415600	875900	A,C,D,I	1,3,6,9

NATIONAL LIST OF AEROSOL PACKAGERS (JULY 1987)

	COMPANY	CITY	STATE	LATITUDE	LONGITUDE	PRODUCT CODE	REFERENCE
120	OAKITE PRODUCTS-3 (SPRAYWAY INC.)	ADDISON	IL	415600	875900		2,6,9
121	ORB INDUSTRIES, INC.	UPLAND	PA	395100	752300	D,E,F,K	3,9
122	PACTRA INDUSTRIES, INC.	UPLAND	CA	340600	1173900	F	7
123	PEERLESS TUBE CO.	BLOOMFIELD	NJ	404800	741200		4
124	PEL ASSOCIATES	NORTH BRANCH	NJ	403600	744100	A,C,D,G,H,K	3,5,9
125	PERCY HARMS CORP.	WHEELING	IL	420800	875500	F	3,6
126	PHARMASOL CORP.	RANDOLPH	MA	421000	710200	A,C,D,G,H,I,K	3
127	PIEDMONT LABS, INC.	GAINESVILLE	GA	341800	835000		3,5
128	PLASTI-KOTE CO.	MEDINA	OH	410800	815200	A,F	3,6
129	PLAZE AEROSOLS, INC.	ST. LOUIS	MO	383700	901200	A,C,D,E,F,G,I,J	4,9
130	PLOUGH, INC.	MEMPHIS	TN	350800	900300		5
131	PRESSPAK, INC.	SUGARLAND	TX	293700	953800	G,H	3
132	PRICE DRISCOLL CORP.	FARMINGDALE	NY	404400	732700		6,9
133	QUEST PACKAGING INC.	HOUSTON	TX	294600	952200		3
134	RAABE PAINT CO., INC.	WAUWATOSA	WI	430300	880000	A,F,D	3,5
135	RADIATOR SPECIALTY CO.	CHARLOTTE	NC	351300	805100		5
136	RALPH SHRADER	DETROIT	MI	422000	830300		5
137	RANDOLPH PRODUCTS CO.	CARLSTADT	NJ	405000	740600	F	3,4
138	RAWN COMPANY, INC.	SPOONER	WI	455000	915300		5
139	REALEX CORP.	BATON ROUGE	LA	302700	911100		5
140	REMPAK INDUSTRIES, INC.	CARTERET	NJ	403400	741300	A,C,D,E,G,H,I	3
141	RITE OFF, INC.	BAY SHORE	NY	404300	731500	A,C,D,E,K	4
142	RUDD PAINT & VARNISH CO.	SEATTLE	WA	473600	1222000		5
143	RUSTOLEUM CORP.	MUNDELEIN	IL	421600	880000		5
144	SC JOHNSON	RACINE	WI	424400	874800		6
145	SCHERING CORP.	ST. LOUIS	MO	383700	901200	H	3
146	SCOTTS LIQUID GOLD	DENVER	CO	394400	1045900		5
147	SECURE AMERICA CORP.	MARIETTA	GA	335700	843300	K	3
148	SECURITY EQUIPMENT CORP.	ST. LOUIS	MO	383700	901200	A,C,D,K,E	3
149	SEYMOUR OF SYCAMORE	SYCAMORE	IL	415900	884100		6
150	SHERWIN WILLIAMS-1 (DUPLI-COLOR)	ELK GROVE VILLAGE	IL	420100	875900		6
151	SHERWIN WILLIAMS-2 (SPRAYON PRODUCTS)	ANAHEIM	CA	335000	1175500		6
152	SHERWIN WILLIAMS-3 (SPRAYON PRODUCTS)	BEDFORD HEIGHTS	OH	412300	813000		2,6
153	SHIELD PACKAGING CO.	CANTON	MA	420900	710900	A,C,D,E,F,G,I,K	3
154	SHIELD PACKAGING OF CALIF.	CHINO	CA	340100	1174100	A,C,D,E,G,K,I	3
155	SHULTON, INC.	WAYNE	NJ				5
156	SOUTHLAND PAINT CO.	GAINESVILLE	TX	333800	970800	F	7
157	SPEER PRODUCTS-1 (PET CHEMICALS)	MIAMI SPRINGS	FL	254900	801800		5
158	SPEER PRODUCTS 2	MEMPHIS	TN	350800	900300	A,C,D,E,K,J	3,8

NATIONAL LIST OF AEROSOL PACKAGERS (JULY 1987)

	COMPANY	CITY	STATE	LATITUDE	LONGITUDE	PRODUCT CODE	REFERENCE
160	SPRAY PRODUCTS CORP.	NORRISTOWN	PA	400700	752100	A,D,E,F	3,9
161	SSP CHEMICAL CO., INC.	ROYERSFORD	PA	401100	753300	C,D,E,F	3
162	STALFORT CONSUMER PRODUCTS	HAVRE DE GRACE	MD	393300	760600	A,C,D,E	3
163	STANDARD BRANDS PAINT CO.	TORRANCE	CA	335000	1181900		1,9
164	STANHOME, INC.	WESTFIELD	MA	420700	724500	A,C,D,E,G	2,3,8,9
165	STAR CHEMICAL CO., INC.	HINSDALE	IL	414800	875600	F,D	3,5
166	STONERS INK CO.	QUARRYVILLE	PA	395400	761000		5
167	STROBEL PRODUCTS, INC.	LOUISVILLE	KY	381500	854600	A,C,D,F	3,9
168	SUN LABS-1 (SOUTHEAST PACKAGING CO.)	ATLANTA	GA	334500	842300	A,C,E,G,K	4,5
169	SUN LABS-2	CHATSWORTH	CA	341500	1183600	G	3,5
170	TALLEY INDUSTRIES (TIME-MIST INC.)	WATERBURY	CT	413300	730300	E	2,9
171	TECH LUBE	ISLIP	NY	404400	731300		6,9
172	TECHNAIR LABS, INC.	RAHWAY	NJ	403700	741600		4
173	TESTOR CORP	ROCKFORD	IL	411500	875800		5
174	THEOCHEM LABORATORIES, INC.	TAMPA	FL	275700	822700		8
175	3M CO.	ST. PAUL	MN	445700	930600	A,C,D,H	3,6
176	TRIMARK PACKAGING, INC.	ENNIS	TX	322000	963800		4
177	ULTRAMOTIVE CORP	BETHEL	VT	435000	723800	A,C,D,G,K,I	3,8
178	UNCOMMON CONGLOMERATES	ST. PAUL	MN	445700	930600		6
179	UNIPACK, INC.	PITTSBURGH	PA	402600	800100	A,C,D,E,F,G,H,K	3
180	UNIVERSAL SPECIALTY PACKAGING	ROSELLE	NJ	404000	741500	B,G,H,K	3,5
181	US AVIEX CO.	NILES	MI	415000	861500	A,C,D,E	3
182	US PACKAGING CORP	WHEELING	IL	420800	875500	A,C,D,F,K	3
183	VALJEAN CORP.	INDIAN HARBOUR BEACH	FL	280900	803600	C,E,G,H,I	3
184	VICTOR INDUSTRIES CORP	CHICO	CA	394400	1215000	A,B,C,D,E,F,G,H,I,K	3
185	WHITMIRE RESEARCH	ST. LOUIS	MO	383700	901200		6
186	WILLIAM BARR & CO.	MEMPHIS	TN	350800	900300		3
187	ZEP MANUFACTURING CO.	ATLANTA	GA	334500	842300	D,E	5,6,9
188	ZIP AEROSOL PRODUCTS	CANOGA PARK	CA	341200	1183500		6,9
189	ZOE CHEMICAL CO., INC.	NEW HYDE PARK	NY	404400	734100	C,D,E,I	3,4,8
190	ZYNOLYTE PRODUCTS CO.	COMPTON	CA	335400	1181300		7

NATIONAL LIST OF AEROSOL PACKAGERS (JULY 1987)

	COMPANY	CITY	STATE	LATITUDE	LONGITUDE	PRODUCT CODE	REFERENCE
PACKAGING FACILITIES WITH UNIDENTIFIED LOCATION							
191	AEROSOL SPECIALTIES						5
192	AMERICAN JET-WAY						5
193	CESSCO, INC.						5
194	CHEMICAL PACKAGING SERVICES, INC.						5
195	CHEMI-COATINGS, INC.						5
196	C.F. BURGER						5
197	EMKO CO.						5
198	FO-MO PRODUCTS						5
199	IG-LO PRODUCTS CORP.						5
200	INTERDYNAMICS, INC.						5
201	JIM YORK CHEMICALS CO.						5
202	MAGNAFLUX CORP.						5
203	MAJOR PAINT						5
204	MILLER-STEPHENSON						5
205	NELSON PAINT						5
206	PETRO CHEMICAL PRODUCTS						5
207	SHIELD CHEMICAL CO.						5
208	SHIRLO, INC.						5
209	TECH SPRAY						5
210	TECHNICAL CHEMICALS						5
211	TRADCO						5
212	UNITED COATINGS						5

PRODUCT CODE:

A - AUTOMOTIVE
B - FOOD
C - HOUSEHOLD
D - INDUSTRIAL
E - INSECTICIDE
F - PAINT
G - PERSONAL
H - PHARMACEUTICAL
I - VETERINARY
K - SPECIALTY

REFERENCE:

1 - STANDARD AND POOR'S REGISTER, 1980
2 - CORPORATE AFFILIATIONS, 1986
3 - AEROSOL AGE BUYER'S GUIDE, OCTOBER 1986
4 - AEROSOL AGE (1985 ISSUES)
5 - CSMA PRESSURIZED PRODUCTS SURVEY, 1985
6 - EPA MEMORANDUM, DOCUMENTATION OF TELEPHONE COMMUNICATIONS CONCERNING THE PACKAGING AND LOCALIZED LARGE-SCALE USERS OF AEROSOL PRODUCTS, PREPARED BY GARY BOCKOL, RADIAN CORPORATION, FEBRUARY 6,1987
7 - OCCUPATIONAL EXPOSURE AND ENVIRONMENTAL ASSESSMENT OF FOUR CHLORINATED SOLVENTS WHEN USED IN AEROSOLS, MARCH 28,1986
8 - CSMA VENDORS TO THE TRADE GUIDE, 1986
9 - THOMAS REGISTER, 1895

APPENDIX D

TRIS LIST OF PHARMACEUTICAL FACILITIES USING METHYLENE CHLORIDE

APPENDIX D

TRIS LIST OF PHARMACEUTICAL FACILITIES USING METHYLENE CHLORIDE

Treatments for Methylene Chloride (CAS 000075092)

SIC	TRIS ID	FACILITY NAME	WC	WTC	IC	STI	EFFIC	OD
283	00617BBTTCROADN	ABBOTT CHEMICALS INC.	A	P21	3		08500	N
283	00617BBTTCROADN	ABBOTT CHEMICALS INC.	A	B11	3		09500	N
283	00617BBTTCROADN	ABBOTT CHEMICALS INC.	A	A02	1		09800	N
283	00617MRCKSSTATE	MERCK SHARP & DOHME QUIMICA DE P.R.	L	F01	1	Y	00000	
283	00617MRCKSSTATE	MERCK SHARP & DOHME QUIMICA DE P.R.	A	A03		Y	10000	Y
283	00617MRCKSSTATE	MERCK SHARP & DOHME QUIMICA DE P.R.	A	A02	1		08000	N
283	00617MRCKSSTATE	MERCK SHARP & DOHME QUIMICA DE P.R.	A	A02	1		07100	N
283	00617MRCKSSTATE	MERCK SHARP & DOHME QUIMICA DE P.R.	A	A02	1		07250	N
283	00617PFZRPHIGHW	PFIZER PHARMACEUTICALS INC.	W	C11	2		00000	N
283	00617PFZRPHIGHW	PFIZER PHARMACEUTICALS INC.	A	A03	2		07300	N
283	00617PFZRPHIGHW	PFIZER PHARMACEUTICALS INC.	L	F11	2		10000	Y
283	00617PFZRPHIGHW	PFIZER PHARMACEUTICALS INC.	A	A02	2		10000	Y
283	00617THPJHHIGHW	UPJOHN MFG. CO.	A	A03	2		02000	N
283	00628LLLLY65THI	ELI LILLY INDUSTRIES INC.	A	P11	2		05400	Y
283	00628LLLLY65THI	ELI LILLY INDUSTRIES INC.		NA	NA		NA	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	A	A02	1		09000	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	A	A02	1		09500	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	A	A03	1		09500	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	A	A04	1		09500	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	A	A02	1	Y	00000	
283	00661SQBBMSTATE	SQUIBB MFG. INC.	A	A03		Y	09400	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	W	F01	3		10000	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	L	F01	1		10000	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	W	B11	3		09800	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	L	R11	1		09000	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	A	A02	1		09000	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	A	A02	1		09500	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	A	A03	1		09000	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	W	F01	4		10000	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	L	F01	1		10000	N
283	00661SQBBMSTATE	SQUIBB MFG. INC.	W	B11	3		09800	N
283	00671KYPHRPRIDC	SCHERING-PLOUGH PRODUCTS INC. KEY PHARMA	A	P12	1	Y	00000	Y
283	00671KYPHRPRIDC	SCHERING-PLOUGH PRODUCTS INC. KEY PHARMA	A	P21		Y	09800	Y
283	00671KYPHRPRIDC	SCHERING-PLOUGH PRODUCTS INC. KEY PHARMA	W	P42		Y	09800	Y
283	00671KYPHRPRIDC	SCHERING-PLOUGH PRODUCTS INC. KEY PHARMA	W	P19		Y	09800	Y
283	00671KYPHRPRIDC	SCHERING-PLOUGH PRODUCTS INC. KEY PHARMA	L	R13		Y	09800	Y
283	00671KYPHRPRIDC	SCHERING-PLOUGH PRODUCTS INC. KEY PHARMA	L	R11		Y	09900	Y
283	00671KYPHRPRIDC	SCHERING-PLOUGH PRODUCTS INC. KEY PHARMA	L	P01	2	Y	00000	N
283	00671KYPHRPRIDC	SCHERING-PLOUGH PRODUCTS INC. KEY PHARMA	L	B11	4	Y	09500	Y
283	00671KYPHRPRIDC	SCHERING-PLOUGH PRODUCTS INC. KEY PHARMA	L	P12		Y	00000	Y
283	00701RCHPRSTATE	ROCHE PRODUCTS INC.	A	P21	1		06000	N
283	00701RCHPRSTATE	ROCHE PRODUCTS INC.	W	P01	3	Y	00000	

Treatments for Methylene Chloride (CAS 000075092)

SIC	TRIS ID	FACILITY NAME	WC	WTC	IC	STI	EFFIC	OD
283	00701RCHPRSTATE	ROCHE PRODUCTS INC.	W	P11		Y	00000	
283	00701RCHPRSTATE	ROCHE PRODUCTS INC.	W	B11		Y	00000	
283	00701RCHPRSTATE	ROCHE PRODUCTS INC.	W	P13		Y	00000	
283	00701RCHPRSTATE	ROCHE PRODUCTS INC.	W	P11		Y	09100	Y
283	00701SCHRNROAD6	SCHERING INDUSTRIAL DEVELOPMENT CORP.		NA			00000	
283	00732BLCHMRDNO1	BILCHEM LTD.	A	A02	1		09000	N
283	00732BLCHMRDNO1	BILCHEM LTD.	W	C11	3		00000	N
283	06340PFZRNEASTE	PFIZER INC. GROTON SITE	G	A02	1		08500	N
283	06340PFZRNEASTE	PFIZER INC. GROTON SITE	G	A03	1		09200	N
283	06340PFZRNEASTE	PFIZER INC. GROTON SITE	W	R13	1		09900	N
283	06340PFZRNEASTE	PFIZER INC. GROTON SITE	G	A03	1		09200	N
283	06340PFZRNEASTE	PFIZER INC. GROTON SITE	W	R13	1		09900	N
283	06810DNBRY131WE	DANBURY PHARMACAL INC.		NA			00000	
283	07072RSYNCFOOTO	ARSYNCO INC.	W	P15	3	Y	00000	Y
283	07072RSYNCFOOTO	ARSYNCO INC.	W	C11		Y	00000	Y
283	07072RSYNCFOOTO	ARSYNCO INC.	W	P11		Y	00000	Y
283	07072RSYNCFOOTO	ARSYNCO INC.	W	P41			09985	Y
283	07080NTRLB650SO	NUTRO LABORATORIES INC.		NA			00000	
283	07083SCHRN1011M	SCHERING CORP.		NA			00000	
283	07083SCHRN1011M	SCHERING CORP.		NA			00000	
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	W	P01	2		00000	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	L	P09	1		00000	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	A	A02	1		08200	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	A	A02	1		07000	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	A	A02	1		09000	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	A	A02	1		07200	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	A	A02	1		09400	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	A	A07	1		00000	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	A	A02	1		08300	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	A	A02	1		09200	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	A	A02	1		06700	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	A	A02	1		00000	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	A	A07	1		09900	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	A	A03	1		09000	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.	A	A02	1		04000	N
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.		NA	NA		NA	N
283	07424MDPHR101EM	AMIDE PHARMACEUTICAL INC.		NA			00000	
283	07463BCRFT12IND	BIOCRAFT LABORATORIES INC.	A	A03	1		09500	N
283	07901CBGGY556MO	CIBA-GEIGY CORP. PHARMACEUTICALS DIV.	A	A02	1		09500	Y
283	07901CBGGY556MO	CIBA-GEIGY CORP. PHARMACEUTICALS DIV.	A	A04	1		09700	Y
283	07901CBGGY556MO	CIBA-GEIGY CORP. PHARMACEUTICALS DIV.	A	A07	1		09900	Y

Treatments for Methylene Chloride (CAS 000075092)

SIC	TRIS ID	FACILITY NAME	WC	WTC	IC	STI	EFFIC	OD
283	07901CBGGY556MO	CIBA-GEIGY CORP. PHARMACEUTICALS DIV.	W	P01	3		10000	Y
283	07901CBGGY556MO	CIBA-GEIGY CORP. PHARMACEUTICALS DIV.	L	R19	1		01800	Y
283	07936SDMKL17WES	SIDMAK LABORATORIES INC.		NA			00000	
283	07936SNDZP59ROU	SANDOZ PHARMACEUTICALS CORP.		NA			00000	
283	08807MRCNCEASTM	AMERICAN CYANAMID CO. LEDERLE LABORATORI	A	A07	1		09000	N
283	08807MRCNCEASTM	AMERICAN CYANAMID CO. LEDERLE LABORATORI	W	C11	3		00000	N
283	08807MRCNCEASTM	AMERICAN CYANAMID CO. LEDERLE LABORATORI	A	A07	1		09000	N
283	08807MRCNCEASTM	AMERICAN CYANAMID CO. LEDERLE LABORATORI	W	C11	3		00000	N
283	08807MRCNCEASTM	AMERICAN CYANAMID CO. LEDERLE LABORATORI		NA	NA		NA	N
283	08854BCHML101PO	SMITHKLINE BEECHAM PHARMACEUTICALS		NA			00000	
283	08854BCHML101PO	SMITHKLINE BEECHAM PHARMACEUTICALS		NA			00000	
283	08876HCHSTRTE20	HOECHST CELANESE CORP. LIFE SCIENCES		NA	NA		NA	N
283	08902RSQBBONESQ	E.R. SQUIBB & SONS	A	A02	1		09500	N
283	08902RSQBBONESQ	E.R. SQUIBB & SONS	A	A02	1		09900	N
283	08902RSQBBONESQ	E.R. SQUIBB & SONS	A	A04	1		09500	Y
283	08902RSQBBONESQ	E.R. SQUIBB & SONS	A	A02	1		09500	N
283	10901CBGGYOLDMI	CIBA-GEIGY CORP. PHARMACEUTICALS DIV.		NA			00000	
283	10920PRPHR75BRE	PAR PHARMACEUTICAL INC.		NA			00000	
283	10965LDRLLNORTH	LEDERLE LABORATORIES	W	B11	3		04700	Y
283	11590TSHCN125ST	TISHCON CORP.						
283	12979YRSTL64MAP	AYERST LABORATORIES INC.	A	A02	1		09400	N
283	13221BRSTLTHOMP	BRISTOL-MYERS SQUIBB CO. INDUSTRIAL DIV.	A	A02	2		09850	N
283	13221BRSTLTHOMP	BRISTOL-MYERS SQUIBB CO. INDUSTRIAL DIV.	A	A02	2		06300	N
283	13221BRSTLTHOMP	BRISTOL-MYERS SQUIBB CO. INDUSTRIAL DIV.	A	A03	2		00000	N
283	13221BRSTLTHOMP	BRISTOL-MYERS SQUIBB CO. INDUSTRIAL DIV.	A	A02	2		09900	N
283	13221BRSTLTHOMP	BRISTOL-MYERS SQUIBB CO. INDUSTRIAL DIV.	W	C11	3		00000	N
283	13221BRSTLTHOMP	BRISTOL-MYERS SQUIBB CO. INDUSTRIAL DIV.	A	A03	2		08750	N
283	13221BRSTLTHOMP	BRISTOL-MYERS SQUIBB CO. INDUSTRIAL DIV.	A	A02	2		09900	N
283	13221BRSTLTHOMP	BRISTOL-MYERS SQUIBB CO. INDUSTRIAL DIV.	A	A02	2		09800	N
283	13221BRSTLTHOMP	BRISTOL-MYERS SQUIBB CO. INDUSTRIAL DIV.	A	A02	2		08000	N
283	13221BRSTLTHOMP	BRISTOL-MYERS SQUIBB CO. INDUSTRIAL DIV.	A	A04	2		09500	N
283	13221BRSTLTHOMP	BRISTOL-MYERS SQUIBB CO. INDUSTRIAL DIV.	W	C11	2		00000	N
283	14623PNNWL755JE	FISONS CORP.	A	A04	2		09600	Y
283	14623PNNWL755JE	FISONS CORP.	A	P42	1		10000	Y
283	14623PNNWL755JE	FISONS CORP.	W	P12	1		08500	Y
283	15147PNNXPEASTE	PENNEX PRODUCTS CO. INC.					NA	
283	17868MRCKC100AV	MERCK & CO. INC.	W	P01	3	Y	NA	
283	17868MRCKC100AV	MERCK & CO. INC.	W	C11		Y	NA	
283	17868MRCKC100AV	MERCK & CO. INC.	W	P11		Y	NA	
283	17868MRCKC100AV	MERCK & CO. INC.	W	B11		Y	NA	
283	17868MRCKC100AV	MERCK & CO. INC.	W	P11		Y	09997	Y

Treatments for Methylene Chloride (CAS 000075092)

SIC	TRIS ID	FACILITY NAME	WC	WTC	IC	STI	EFFIC	OD
283	17868MRCKC100AV	MERCK & CO. INC.	A	A02	2		08300	N
283	17868MRCKC100AV	MERCK & CO. INC.	A	A02	2		09100	N
283	19034RRRPH500VI	RHONE-POULENC RORER PHARMACEUT ICAL INC.		NA			00000	
283	19130SMTHK1500S	SMITHKLINE BEECHAM PHARMACEUTICALS	A	F71	2	Y	00000	
283	19130SMTHK1500S	SMITHKLINE BEECHAM PHARMACEUTICALS	A	A03		Y	08690	Y
283	19130SMTHK1500S	SMITHKLINE BEECHAM PHARMACEUTICALS		NA			00000	
283	19382FRMNT510EU	FERMTEC PRODUCTS INC.	W	B11	3		10000	N
283	19382FRMNT510EU	FERMTEC PRODUCTS INC.	W	B11	3		10000	N
283	19382WYTHY611EN	WYETH-AYERST LABORATORIES INC.	W	P01	3	Y	00000	
283	19382WYTHY611EN	WYETH-AYERST LABORATORIES INC.	W	B11		Y	00000	
283	19382WYTHY611EN	WYETH-AYERST LABORATORIES INC.	W	P14		Y	09500	N
283	19382WYTHY611EN	WYETH-AYERST LABORATORIES INC.	W	P01	3	Y	00000	
283	19382WYTHY611EN	WYETH-AYERST LABORATORIES INC.	W	B11		Y	00000	
283	19382WYTHY611EN	WYETH-AYERST LABORATORIES INC.	W	P14		Y	09000	N
283	19428SMTHK900RI	SMITHKLINE BEECHAM PHARMACEUTI CALS	W	F01	2		00100	Y
283	19428SMTHK900RI	SMITHKLINE BEECHAM PHARMACEUTI CALS	A	A02	1		00096	N
283	19428SMTHK900RI	SMITHKLINE BEECHAM PHARMACEUTI CALS	A	A03	2		00005	N
283	19428SMTHK900RI	SMITHKLINE BEECHAM PHARMACEUTI CALS		NA	NA		00000	N
283	19801NRMCF500OL	NORAMCO OF DELAWARE INC.		NA			00000	
283	21225KNSCL6118R	KANASCO LTD.		NA			NA	
283	21225KNSCL6118R	KANASCO LTD.		NA			00000	
283	23805LLBRT2999F	LEE LABORATORIES INC. & INFRACORP LTD.	W	P15	4	Y	NA	
283	23805LLBRT2999F	LEE LABORATORIES INC. & INFRACORP LTD.	W	C11		Y	00000	N
283	23805LLBRT2999F	LEE LABORATORIES INC. & INFRACORP LTD.	A	A03	3		00000	N
283	27597GLXNC1011N	GLAXO INC. TECHNICAL OPERATIONS DIV.	A	A02	1	Y	00000	
283	27597GLXNC1011N	GLAXO INC. TECHNICAL OPERATIONS DIV.		A04		Y	00100	N
283	27597GLXNC1011N	GLAXO INC. TECHNICAL OPERATIONS DIV.					00000	
283	27597GLXNC1011N	GLAXO INC. TECHNICAL OPERATIONS DIV.					00000	
283	27835BRRGHINTER	BURROUGHS WELLCOME CO.	W	C11	2		03200	N
283	27835BRRGHINTER	BURROUGHS WELLCOME CO.	A	A02	1		10000	N
283	27835BRRGHINTER	BURROUGHS WELLCOME CO.	L	R11	1		09000	N
283	27835BRRGHINTER	BURROUGHS WELLCOME CO.	L	F01	1	Y	NA	
283	27835BRRGHINTER	BURROUGHS WELLCOME CO.	A	A03		Y	10000	Y
283	31708MRCKC3517R	MERCK & CO. INC. FLINT RIVER PLANT	W	P01	2	Y	NA	
283	31708MRCKC3517R	MERCK & CO. INC. FLINT RIVER PLANT	W	C11		Y	NA	
283	31708MRCKC3517R	MERCK & CO. INC. FLINT RIVER PLANT	W	B11		Y	NA	
283	31708MRCKC3517R	MERCK & CO. INC. FLINT RIVER PLANT	W	P11		Y	NA	
283	31708MRCKC3517R	MERCK & CO. INC. FLINT RIVER PLANT	S	P13		Y	09500	N
283	37620BCHMLINDUS	BEECHAM LABORATORIES	A	A03	1		00140	N
283	37620BCHMLINDUS	BEECHAM LABORATORIES	W	A03	1		09860	N
283	45215MRRLL2110E	MERRELL DOW PHARMACEUTICALS INC.	A	A03	2		00000	N

Treatments for Methylene Chloride (CAS 000075092)

SIC	TRIS ID	FACILITY NAME	WC	WTC	IC	STI	EFFIC	OD
283	45215MRRLL2110E	MERRELL DOW PHARMACEUTICALS INC.		NA			00000	
283	46285LLLLY1555K	ELI LILLY & CO. LILLY INDUSTRIAL CENTER	A	A02	1		07500	N
283	46285LLLLY1555K	ELI LILLY & CO. LILLY INDUSTRIAL CENTER		NA	NA		NA	N
283	46285LLLLYLILLY	ELI LILLY & CO. LILLY CORPORATE CENTER	A	A07	3		10000	N
283	46285LLLLYLILLY	ELI LILLY & CO. LILLY CORPORATE CENTER	A	A03	3		05000	N
283	46285LLLLYLILLY	ELI LILLY & CO. LILLY CORPORATE CENTER	L	R12	1	Y	NA	N
283	46285LLLLYLILLY	ELI LILLY & CO. LILLY CORPORATE CENTER	A	A02	NA	Y	10000	N
283	46285LLLLYLILLY	ELI LILLY & CO. LILLY CORPORATE CENTER		NA	NA		NA	N
283	47721BRSTL2404P	MEAD JOHNSON & CO. EVANSVILLE PLANT	A	A03	2		09000	N
283	47721BRSTL2404P	MEAD JOHNSON & CO. EVANSVILLE PLANT		NA			00000	
283	47842LLLLYSTATE	ELI LILLY & CO. CLINTON LABORATORIES	W	F01	1		10000	N
283	47842LLLLYSTATE	ELI LILLY & CO. CLINTON LABORATORIES	L	F01	1		10000	N
283	47842LLLLYSTATE	ELI LILLY & CO. CLINTON LABORATORIES	A	F71	1		10000	N
283	47842LLLLYSTATE	ELI LILLY & CO. CLINTON LABORATORIES	A	A02	1		08500	N
283	47842LLLLYSTATE	ELI LILLY & CO. CLINTON LABORATORIES	L	R11	1		07300	Y
283	47842LLLLYSTATE	ELI LILLY & CO. CLINTON LABORATORIES		NA	NA		NA	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	A	A02	1		08500	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	A	A03	1		01000	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	W	B11	3		00000	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	W	C11	3		00000	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	L	F01	1		09900	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	L	P01	1		00000	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	W	P01	3		00000	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	W	P11	3		00500	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	S	P13	3		01800	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	W	F01	2		09900	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	W	P41	3		09000	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	W	P42	1		09000	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	L	R13	1		09000	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	A	P21	1		08000	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES	L	C11	1		00000	N
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES		NA	NA		NA	N
283	49001THPJH7171P	UPJOHN CO. PRODUCTION FACILITY	L	R13	1		08500	Y
283	49001THPJH7171P	UPJOHN CO. PRODUCTION FACILITY	L	R11	1		08800	Y
283	49001THPJH7171P	UPJOHN CO. PRODUCTION FACILITY	L	F19	2		09999	N
283	49001THPJH7171P	UPJOHN CO. PRODUCTION FACILITY	A	A02	1		08000	N
283	49001THPJH7171P	UPJOHN CO. PRODUCTION FACILITY	A	A02	1	Y	NA	N
283	49001THPJH7171P	UPJOHN CO. PRODUCTION FACILITY	A	A03	NA	Y	09900	N
283	49001THPJH7171P	UPJOHN CO. PRODUCTION FACILITY		NA	NA		NA	N
283	49001THPJH7171P	UPJOHN CO. PRODUCTION FACILITY	A	A02	1		08000	N
283	49001THPJH7171P	UPJOHN CO. PRODUCTION FACILITY		NA	NA		NA	N

Treatments for Methylene Chloride (CAS 000075092)

SIC	TRIS ID	FACILITY NAME	WC	WTC	IC	STI	EFFIC	OD
283	49424PRKDV188HO	PARKE-DAVIS DIV. OF WARNER-LAMBERT CO.	W	P01	3		00000	N
283	49424PRKDV188HO	PARKE-DAVIS DIV. OF WARNER-LAMBERT CO.	S	P12	3		00000	N
283	49424PRKDV188HO	PARKE-DAVIS DIV. OF WARNER-LAMBERT CO.	A	F71	1		09999	Y
283	49424PRKDV188HO	PARKE-DAVIS DIV. OF WARNER-LAMBERT CO.	L	R11	1		09500	N
283	55447PSHRS14905	UPSHER-SMITH LABORATORIES INC.		NA			00000	
283	56623RDRWL210MA	REID-ROWELL INC.		NA			00000	
283	60064BBTTL1400N	ABBOTT LABORATORIES	W	B11	2		09930	Y
283	60064BBTTL1400N	ABBOTT LABORATORIES	A	A02	1		09500	N
283	60077GDSRL4901S	G. D. SEARLE & CO.	A	A02	1		07000	N
283	60077GDSRL4901S	G. D. SEARLE & CO.		NA	NA		NA	N
283	60915RMRPHRT50A	ARMOUR PHARMACEUTICAL CO.		NA			00000	
283	63141KVPHR2303S	KV PHARMACEUTICAL CO.	A	A07	3		00000	Y
283	64137MRNLBMARIO	MARION MERRELL DOW INC. MARION PARK		NA			00000	
283	65807SYNTX2460W	SYNTEX AGRIBUSINESS INC.	W	P41	3		08000	N
283	65807SYNTX2460W	SYNTEX AGRIBUSINESS INC.	A	A03	2		00300	N
283	68521NRDNL601WE	SMITHKLINE BEECHAM ANIMAL HEALTH		NA			00000	
283	80020CRDLB2555W	GENEVA PHARMACEUTICALS INC.		NA			00000	
283	80301HSRCH4750N	HAUSER CHEMICAL RESEARCH INC.	L	R11	1		09600	Y
283	80301SYNTX2075N	SYNTEX CHEMICALS INC.	A	A03	2	Y	NA	N
283	80301SYNTX2075N	SYNTEX CHEMICALS INC.	A	A04	NA	Y	00500	N
283	80301SYNTX2075N	SYNTEX CHEMICALS INC.	A	A04	2		00000	N
283	80301SYNTX2075N	SYNTEX CHEMICALS INC.	W	B11	2		09600	N
283	80301SYNTX2075N	SYNTEX CHEMICALS INC.		NA	NA		NA	N
283	85260NTRLL14810	NATURALLY VITAMIN SUPPLEMENTS INC.		NA			00000	
283	90505BCHMN3132K	BACHEM INC.		NA			00000	
283	91324MRKR 19901	3M RIKER		NA			00000	
283	92121MLTPL3550G	MULTIPLE PEPTIDE SYSTEMS L.P.	L	R11	1		08300	N
283	92713NBLCN17802	ANABOLIC INC.	A	P41	2		00130	N
283	94303LZCRP2575H	ALZA CORP.	A	F71	1	Y	NA	
283	94303LZCRP2575H	ALZA CORP.	A	A03		Y	10000	Y
283	95688LZCRP700EU	ALZA CORP.	A	A02	1		09300	Y

SIC=283

SIC	TRIS ID	FACILITY NAME
283	85260NTRLL14810	NATURALLY VITAMIN SUPPLEMENTS INC.
283	37620BCHMLINDUS	BEECHAM LABORATORIES
283	14623PNNWL755JE	FISONS CORP.
283	15147PNNXPEASTE	PENNEX PRODUCTS CO. INC.
283	06810DNBRY131WE	DANBURY PHARMACAL INC.
283	80020CRDLB2555W	GENEVA PHARMACEUTICALS INC.
283	19034RRRPH500VI	RHONE-POULENC RORER PHARMACEUT ICAL INC.
283	31708MRCKC3517R	MERCK & CO. INC. FLINT RIVER PLANT
283	23805LLBRT2999F	LEE LABORATORIES INC. & INFRACORP LTD.
283	07080NTRLB650SO	NUTRO LABORATORIES INC.
283	07936SNDZP59ROU	SANDOZ PHARMACEUTICALS CORP.
283	00617MRCKSSTATE	MERCK SHARP & DOHME QUIMICA DE P.R.
283	55447PSHRS14905	UPSHER-SMITH LABORATORIES INC.
283	12979YRSTL64MAP	AYERST LABORATORIES INC.

LOCATION	PARENT COMPANY
SCOTTSDALE, AZ	MARLYN CO.
BRISTOL, TN	SMITHKLINE BEECHAM PHARMACEUTI
ROCHESTER, NY	FISONS CORP.
VERONA, PA	NV MEDICOPHARMA
DANBURY, CT	HENRY SCHEIN INC.
BROOMFIELD, CO	CIBA GEIGY CORP.
FORT WASHINGTON, PA	RHONE-POULENC RORER INC.
ALBANY, GA	MERCK & CO. INC.
PETERSBURG, VA	BOEHRINGER INGELHEIM & A. H. R
SOUTH PLAINFIELD, NJ	NA
EAST HANOVER, NJ	SANDOZ CORP.
BARCELONETA, PR	MERCK & CO. INC.
MINNEAPOLIS, MN	NA
ROUSES POINT, NY	AMERICAN HOME PRODUCTS CORP.

ONSITE	FUGITIVE EMISSIONS	FC	STACK EMISSIONS	SC	TOTAL EMISSIONS
02	0	O	100	O	100
04	0		184028	M	184028
04	250	O	2016	O	2266
	1148	C	140000	C	141148
03	250	O	162000	C	162250
03	0		14412	C	14412
03	0		31367	C	31367
06	250000	O	1200000	O	1450000
04	51	O	7900	O	7951
03	0		30000	C	30000
04	93	O	2250	O	2343
04	650	M	270	O	920
03	0		120000	C	120000
04	250	O	16000	E	16250

SIC=283
(continued)

SIC	TRIS ID	FACILITY NAME
283	17868MRCKC100AV	MERCK & CO. INC.
283	06340PFZRNEASTE	PFIZER INC. GROTON SITE
283	07936SDMKL17WES	SIDMAK LABORATORIES INC.
283	10920PRPHR75BRE	PAR PHARMACEUTICAL INC.
283	64137MRNLBMARIO	MARION MERRELL DOW INC. MARION PARK
283	90505BCHMN3132K	BACHEM INC.
283	68521NRDNL601WE	SMITHKLINE BEECHAM ANIMAL HEALTH
283	60915RMRPHRT50A	ARMOUR PHARMACEUTICAL CO.
283	00701SCHRNROAD6	SCHERING INDUSTRIAL DEVELOPMENT CORP.
283	07424MDPHR101EM	AMIDE PHARMACEUTICAL INC.
283	65807SYNTX2460W	SYNTEX AGRIBUSINESS INC.
283	00617THPJHHIGHW	UPJOHN MFG. CO.
283	19382FRMNT510EU	FERMTEC PRODUCTS INC.

LOCATION	PARENT COMPANY
RIVERSIDE, PA	MERCK & CO. INC.
GROTON, CT	PFIZER INC.
EAST HANOVER, NJ	NA
CONGERS, NY	NA
KANSAS CITY, MO	DOW CHEMICAL CO.
TORRANCE, CA	NA
LINCOLN, NE	SMITHKLINE BEECHAM CORP.
BRADLEY, IL	RHONE-POULENC RORER INC.
MANATI, PR	SCHERING INDUSTRIAL DEVELOPMEN
LITTLE FALLS, NJ	NA
SPRINGFIELD, MO	SYNTEX USA INC.
BARCELONETA, PR	UPJOHN CO.
WEST CHESTER, PA	BURNS PHILP & CO. LTD.

ONSITE	FUGITIVE EMISSIONS	FC	STACK EMISSIONS	SC	TOTAL EMISSIONS
05	200000	O	110000	O	310000
05	17000	M	8500	O	25500
03	4395	C	171398	C	175793
03	200	O	1300	C	1500
04	750	E	58000	C	58750
03	5	O	250	O	255
04	5200	O	1080500	C	1085700
04	0		9600	O	9600
04	250	O	27558	C	27808
03	2192	O	19730	O	21922
05	31243	E	821777	C	853020
06	4995	E	584777	E	589772
04	0		250	E	250

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(continued)

SIC	TRIS ID	FACILITY NAME
283	10901CBGGYOLDMI	CIBA-GEIGY CORP. PHARMACEUTICALS DIV.
283	27835BRRGHINTER	BURROUGHS WELLCOME CO.
283	07083SCHRN1011M	SCHERING CORP.
283	00617PFZRPHIGHW	PFIZER PHARMACEUTICALS INC.
283	80301HSRCH4750N	HAUSER CHEMICAL RESEARCH INC.
283	27597GLXNC1011N	GLAXO INC. TECHNICAL OPERATIONS DIV.
283	94303LZCRP2575H	ALZA CORP.
283	45215MRRLL2110E	MERRELL DOW PHARMACEUTICALS INC.
283	80301SYNTX2075N	SYNTEX CHEMICALS INC.
283	19382WYTHY611EN	WYETH-AYERST LABORATORIES INC.
283	07463BCRFT12IND	BIOCRAFT LABORATORIES INC.
283	08902RSQBBONESQ	E.R. SQUIBB & SONS
283	47721BRSTL2404P	MEAD JOHNSON & CO. EVANSVILLE PLANT

LOCATION	PARENT COMPANY
SUFFERN, NY	CIBA-GEIGY CORP. USA
GREENVILLE, NC	WELLCOME FOUNDATION LTD.
UNION, NJ	SCHERING-PLOUGH CORP.
BARCELONETA, PR	PFIZER INC.
BOULDER, CO	NA
ZEBULON, NC	GLAXO ENTERPRISES INC.
PALO ALTO, CA	NA
CINCINNATI, OH	MARION MERRELL DOW INC.
BOULDER, CO	SYNTEX (USA) INC.
WEST CHESTER, PA	AMERICAN HOME PRODUCTS
WALDWICK, NJ	BIOCRAFT LABORATORIES INC.
NORTH BRUNSWICK, NJ	BRISTOL-MYERS SQUIBB CO.
EVANSVILLE, IN	BRISTOL-MYERS SQUIBB CO.

ONSITE	FUGITIVE EMISSIONS	FC	STACK EMISSIONS	SC	TOTAL EMISSIONS
03	2974	O	14978	C	17952
04	13000	C	433000	C	446000
04	0	O	76263	O	76263
05	24000	O	37100	O	61100
04	61400	CM	0		61400
04	2290	O	155334	C	157624
04	250	O	3434	O	3684
04	400	O	25000	C	25400
05	250	O	61300	O	61550
05	4800	O	28400	O	33200
04	2514	O	6694	O	9208
04	4100	O	4100	O	8200
04	250	O	51300	C	51550

SIC=283
(continued)

SIC	TRIS ID	FACILITY NAME
283	00617BBTTCROADN	ABBOTT CHEMICALS INC.
283	49424PRKDV188HO	PARKE-DAVIS DIV. OF WARNER-LAMBERT CO.
283	07901CBGGY556MO	CIBA-GEIGY CORP. PHARMACEUTICALS DIV.
283	13221BRSTLTHOMP	BRISTOL-MYERS SQUIBB CO. INDUSTRIAL DIV.
283	10965LDRLLNORTH	LEDERLE LABORATORIES
283	60064BBTTL1400N	ABBOTT LABORATORIES
283	00701RCHPRSTATE	ROCHE PRODUCTS INC.
283	21225KNSCL6118R	KANASCO LTD.
283	56623RDRWL210MA	REID-ROWELL INC.
283	19801NRMCF5000L	NORAMCO OF DELAWARE INC.
283	00671KYPHRPRIDC	SCHERING-PLOUGH PRODUCTS INC. KEY PHARMA
283	00661SQBBMSTATE	SQUIBB MFG. INC.
283	07072RSYNCFOOTO	ARSYNCO INC.

LOCATION	PARENT COMPANY
BARCELONETA, PR	ABBOTT LABORATORIES INC.
HOLLAND, MI	WARNER LAMBERT CO.
SUMMIT, NJ	CIBA-GEIGY CORP.
SYRACUSE, NY	BRISTOL-MYERS SQUIBB CO.
PEARL RIVER, NY	AMERICAN CYANAMID CO.
NORTH CHICAGO, IL	ABBOTT LABORATORIES INC.
MANATI, PR	HOFFMANN-LA ROCHE LTD.
BALTIMORE, MD	
BAUDETTE, MN	SOLVAY PHARMACEUTICAL INC.
WILMINGTON, DE	JOHNSON & JOHNSON
LAS PIEDRAS, PR	SCHERING CORP.
HUMACAO, PR	BRISTOL-MYERS SQUIBB CO.
CARLSTADT, NJ	ACETO CHEMICAL CO.

ONSITE	FUGITIVE EMISSIONS	FC	STACK EMISSIONS	SC	TOTAL EMISSIONS
05	784762	C	1741170	C	2525932
04	1100	O	5	O	1105
05	0	C	13400	C	13400
05	190000	C	110000	E	300000
04	0	O	3300	O	3300
05	7700	O	117550	O	125250
04	4914	O	13608	O	18522
05	1500	O	1400	O	2900
04	0		100117	C	100117
05	11362	E	19815	E	31177
05	41000	E	54800	O	95800
05	95640	O	93260	O	188900
04	108778	O	16821	O	125599

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(continued)

SIC	TRIS ID	FACILITY NAME
283	08807MRCNCEASTM	AMERICAN CYANAMID CO. LEDERLE LABORATORI
283	11590TSHCN125ST	TISHCON CORP.
283	91324MRKR 19901	3M RIKER
283	47905LLLLYLILLY	ELI LILLY & CO. TIPPECANOE LABORATORIES
283	19428SMTHK900RI	SMITHKLINE BEECHAM PHARMACEUTI CALS
283	60077GDSRL4901S	G. D. SEARLE & CO.
283	00628LLLLY65THI	ELI LILLY INDUSTRIES INC.
283	08807MRCNCEASTM	AMERICAN CYANAMID CO. LEDERLE LABORATORI
283	07110HFFMN340KI	HOFFMANN-LA ROCHE INC.
283	49001THPJH7171P	UPJOHN CO. PRODUCTION FACILITY
283	46285LLLLYLILLY	ELI LILLY & CO. LILLY CORPORATE CENTER
283	46285LLLLY1555K	ELI LILLY & CO. LILLY INDUSTRIAL CENTER
283	47842LLLLYSTATE	ELI LILLY & CO. CLINTON LABORATORIES

LOCATION	PARENT COMPANY
BRIDGEWATER, NJ	AMERICAN CYANAMID CO.
WESTBURY, NY	TISHCON CORP.
NORTHRIDGE, CA	3M CO.
SHADELAND, IN	ELI LILLY &. CO.
CONSHOHOCKEN, PA	SMITHKLINE BEECHAM PHARMACEUTI
SKOKIE, IL	MONSANTO CO.
CAROLINA, PR	ELI LILLY &. CO.
BRIDGEWATER, NJ	AMERICAN CYANAMID CO.
NUTLEY, NJ	ROCHE HOLDINGS INC.
PORTAGE, MI	UPJOHN CO.
INDIANAPOLIS, IN	ELI LILLY & CO.
INDIANAPOLIS, IN	ELI LILLY & CO.
CLINTON, IN	ELI LILLY & CO.

ONSITE	FUGITIVE EMISSIONS	FC	STACK EMISSIONS	SC	TOTAL EMISSIONS
04	343	O	27345	O	27688
03	0		190971	C	190971
03	1560	C	15600	C	17160
06	180000	O	530000	O	710000
04	250	E	1700	O	1950
04	3200	O	1200	O	4400
03	18000	O	17000	C	35000
04	597	O	28905	O	29502
05	12369	O	6372	O	18741
06	662600	E	2302300	O	2964900
03	6500	C	1200	C	7700
04	11000	O	200000	O	211000
06	1600000	C	810000	O	2410000

SIC=283
(continued)

SIC	TRIS ID	FACILITY NAME
283	95688LZCRP700EU	ALZA CORP.
283	19130SMTHK1500S	SMITHKLINE BEECHAM PHARMACEUTICALS
283	08854BCHML101PO	SMITHKLINE BEECHAM PHARMACEUTICALS
283	92121MLTPL3550G	MULTIPLE PEPTIDE SYSTEMS L.P.
283	92713NBLCN17802	ANABOLIC INC.
283	63141KVPHR2303S	KV PHARMACEUTICAL CO.
283	00732BLCHMRDNO1	BILCHEM LTD.
283	08876HCHSTRTE20	HOECHST CELANESE CORP. LIFE SCIENCES

SIC

LOCATION	PARENT COMPANY
VACAVILLE, CA	NA
PHILADELPHIA, PA	SMITHKLINE BEECHAM CORP.
PISCATAWAY, NJ	SMITHKLINE BEECHMAN CORP.
SAN DIEGO, CA	NA
IRVINE, CA	NA
SAINT LOUIS, MO	NA
PONCE, PR	BOHERINGER INGELHEIM INC.
SOMERVILLE, NJ	HOECHST CELANESE CORP.

ONSITE	FUGITIVE EMISSIONS	FC	STACK EMISSIONS	SC	TOTAL EMISSIONS
05	3563	O	24693	O	28256
04	5	O	55000	C	55005
05	750	O	5100	E	5850
03	750	O	0		750
04	250	O	14900	M	15150
04	0		299733	C	299733
04	1410	O	27229	O	28639
03	250	C	0	NA	250
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	4385303		12545380		16930683

Key:

SIC = Standard Industrial Classification

TRIS = Toxic Chemical Release Inventory System

CAS = Chemical Abstract Service Registry Number

WC = General Wastestream type; where

A = Gaseous (gases, vapors, airborne particulates),
W = Wastewater (aqueous waste),
L = Liquid Waste (non-aqueous waste), and
S = Solid Waste (including sludges and slurries).

WTC = Waste Treatment Code; as indicated by the following.

Air Emissions Treatment

A01 Flare
A02 Condenser
A03 Scrubber
A04 Absorber
A05 Electrostatic Precipitator
A06 Mechanical Separation
A07 Other Air Emission Treatment

Biological Treatment

B11 Biological Treatment -- Aerobic
B21 Biological Treatment -- Anaerobic
B31 Biological Treatment -- Facultative
B99 Biological Treatment -- Other

Chemical Treatment

C01 Chemical Precipitation -- Lime or Sodium Hydroxide
C02 Chemical Precipitation -- Sulfide
C09 Chemical Precipitation -- Other
C11 Neutralization
C21 Chromium Reduction
C31 Complexed Metals Treatment (other than pH Adjustment)
C41 Cyanide Oxidation -- Alkaline Chlorination
C42 Cyanide Oxidation -- Electrochemical
C43 Cyanide Oxidation -- Other
C44 General Oxidation (including Disinfection) -- Chlorination
C45 General Oxidation (including Disinfection) -- Ozonation
C46 General Oxidation (including Disinfection) -- Other
C99 Other Chemical Treatment

Recovery/Reuse

R01 Reuse as Fuel -- Industrial Kiln
R02 Reuse as Fuel -- Industrial Furnace
R03 Reuse as Fuel -- Boiler
R04 Reuse as Fuel -- Fuel Blending
R09 Reuse as Fuel -- Other
R11 Solvents/Organics Recovery -- Batch Still Distillation
R12 Solvents/Organics Recovery -- Thin-Film Evaporation
R13 Solvents/Organics Recovery -- Fractionation
R14 Solvents/Organics Recovery -- Solvent Extraction
R19 Solvents/Organics Recovery -- Other
R21 Metals Recovery -- Electrolytic
R22 Metals Recovery -- Ion Exchange
R23 Metals Recovery -- Acid Leaching
R24 Metals Recovery -- Reverse Osmosis
R26 Metals Recovery -- Solvent Extraction
R29 Metals Recovery -- Other
R99 Other Reuse or Recovery

Solidification/Stabilization

G01 Cement Processes (including Silicates)
G09 Other Pozzolonic Processes (including Silicates)
G11 Asphaltic Processes
G21 Thermoplastic Techniques
G99 Other Solidification Processes

Incineration/Thermal Treatment

F01 Liquid Injection
F11 Rotary Kiln with Liquid Injection Unit
F19 Other Rotary Kiln
F31 Two Stage
F41 Fixed Hearth
F42 Multiple Hearth
F51 Fluidized Bed
F61 Infra-Red
F71 Fume/Vapor
F81 Pyrolytic Destructor
F82 Wet Air Oxidation
F83 Thermal Drying/Dewatering
F99 Other Incineration/Thermal Treatment

Physical Treatment

P01 Equalization
P09 Other Blending
P11 Settling/Clarification
P12 Filtration
P13 Sludge Dewatering (non-thermal)
P14 Air Flotation
P15 Oil Skimming
P16 Emulsion Breaking -- Thermal
P17 Emulsion Breaking -- Chemical
P18 Emulsion Breaking -- Other
P19 Other Liquid Phase Separation
P21 Adsorption -- Carbon
P22 Adsorption -- Ion Exchange (other than for recovery/reuse)
P23 Adsorption -- Resin
P29 Adsorption -- Other
P31 Reverse Osmosis (other than for recovery/reuse)
P41 Stripping -- Air
P42 Stripping -- Steam
P49 Stripping -- Other
P51 Acid Leaching (other than for recovery/reuse)
P61 Solvent Extraction (other than for recovery/reuse)
P99 Other Physical Treatment

IC = Influent Concentration; where

1 = Greater than 1%,
2 = 100 parts per million (ppm; 0.01%) to 1% (10,000 ppm)
3 = 1 ppm to 100 ppm,
4 = 1 part per billion (ppb) to 1 ppm, and
5 = Less than 1 ppb.

STI = Sequential Treatment; where

Y indicates that individual treatment steps are used in a series to treat the toxic chemical and there is no data on the efficiency of each step, however, an estimate of overall efficiency of the treatment sequence can be estimated.

EFFIC = Efficiency Estimate (i.e., refers to the percent destruction, degradation, conversion, or removal of the listed toxic chemical from the waste stream.

OD = Operating Data; where

Y = The treatment efficiency estimate is based on actual operating data,

N = The treatment efficiency is not based on actual operating data, and

NA = Not applicable.

Parent Company = the highest level company, located in the Unites States, that directly owns at least 50% of the voting stock.

On-Site = The maximum quantity of the chemical (e.g., in storage tanks, process vessels, on-site shipping containers) at your facility at any time during the calendar year. The following codes represent the weight range in pounds on-site.

WEIGHT RANGE IN POUNDS

Range Code	From...	To...
01	0	99
02	100	999
03	1,000	9,999
04	10,000	99,999
05	100,000	999,999
06	1,000,000	9,999,999
07	10,000,000	49,999,999
08	50,000,000	99,999,999
09	100,000,000	499,999,999
10	500,000,000	999,999,999
11	1 billion	more than 1 billion

Fugitive Emissions = all releases to the air that are not released through stacks, vents, ducts, pipes, or any other confined air stream (pounds/year).

FC = Basis of Fugitive Emissions Estimate.

SC = Basis of Stack Emissions Estimate.

FC and SC codes are as follows:

M - Estimate is based on monitoring data or measurements for the toxic chemical as released to the environment and/or off-site facility.

C - Estimate is based on mass balance calculations, such as calculation of the amount of the toxic chemical in streams entering and leaving process equipment.

E - Estimate is based on published emission factors, such as those relating release quantity to through-put or equipment type (e.g., air emission factors).

O - Estimate is based on other approaches such as engineering calculations (e.g., estimating volatilization using published mathematical formulas) or best engineering judgement. This would include applying an estimated removal efficiency to a waste stream, even if the composition of the stream before treatment was fully identified through monitoring data.

Source: Toxic Chemical Release Inventory Reporting Form R and Instructions, Revised 1990 Version, Section 313 of the Emergency Planning and Community Right-to-Know Act (Title III of the Superfund Amendments and Reauthorization Act of 1986). U.S. Environmental Protection Agency, Office of Toxic Substances, Washington, DC, EPA 560/4-91-007, January 1991.

APPENDIX E

CALCULATION OF UNCONTROLLED OPEN-TOP VAPOR CLEANER EMISSION FACTOR INCORPORATING RECYCLE

EXAMPLE CALCULATION: UNCONTROLLED EMISSION FACTOR CONSIDERING RECYCLE

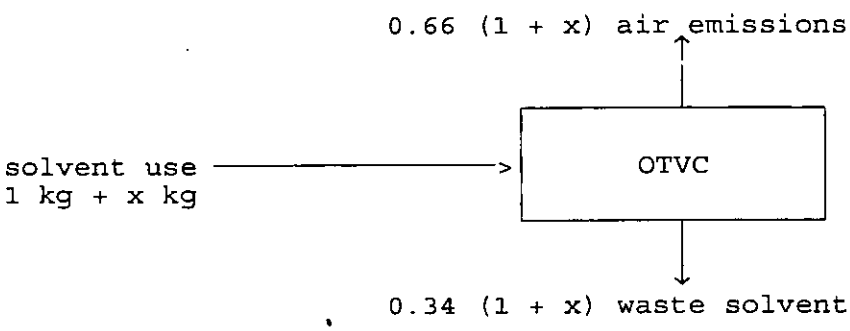
- A material balance is used to estimate emission factors (kg emitted/kg fresh solvent used) considering off-site waste solvent recycle. OTVC factors are shown as an example.

- The emission factor for OTVC not considering waste solvent recycle is 0.66 kg emitted/kg used. The remainder of usage (.34 kg/kg) becomes waste solvent.

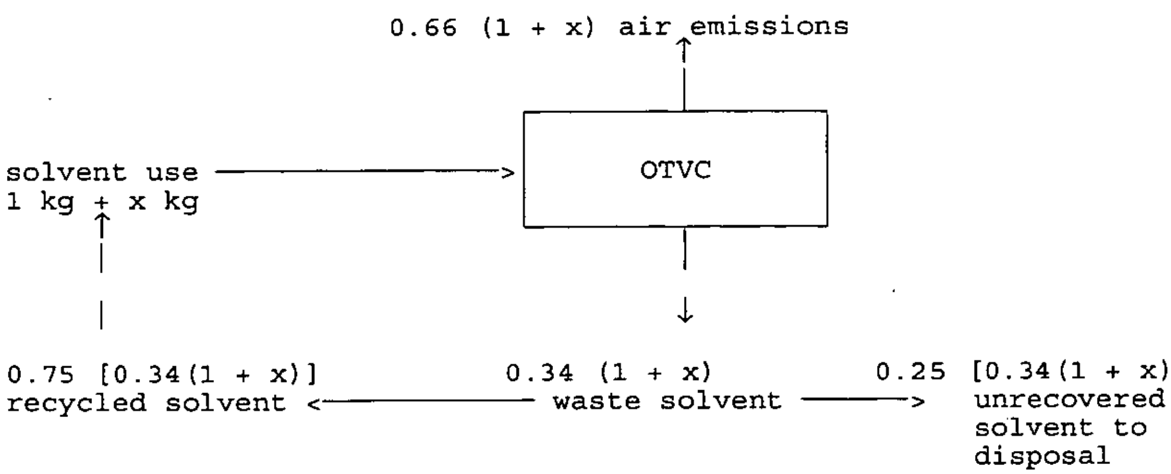
- Let x - recycled solvent use.

- For every 1 kg of fresh (virgin) solvent used:

  - Total solvent use = 1 + x
  - Total air emissions = 0.66 (solvent use) = 0.66 (1 + x)
  - Waste solvent = 0.34 (1 + x)



- It is assumed that 75% of waste solvent is recovered by off-site solvent recyclers and returned for use in cleaning. The other 25% is unrecovered and is disposed of.



- Calculate amount of recycled solvent used

  $x = 0.75\ [0.34(1 + x)]$

  $x = 0.342$
  (kg of recycled solvent used per kg fresh solvent used)

- Calculate air emissions

  $x = 0.66\ (1 + x) = 0.89$
  (kg emitted to the air per kg fresh solvent)

- Thus, emission factor for OTVC considering recycle = 0.89 kg/kg fresh solvent use.

Source: Memorandum from R. C. Mead and R. F. Pandullo, Radian Corporation, to D. Beck, U.S. Environmental Protection Agency. Calculation of Number of Organic Solvent Cleaners and Solvent Emissions and Use Per Model Plant. September 8, 1987.

R000693

Illinois EPA

Bureau of Land, DLPC/FOS
Chain of Custody Document
Page 1 of 1

Fund: LP41 | BOL #: 0210600007 | County: Christian | Locality: Taylorville

Section: F | USEPA ID#: | Site Name: Brandis Aircraft (The Paint Shop) | File Category: FOS

Paul Eisenbrandt, Inspector / Project Manager c/o IEPA
Springfield Field Staff – MC#10
1021 North Grand Avenue East
Springfield, IL 62794-9276 TEL-217/557-8761 FAX-217/557/-8728

IEPA Laboratory
825 N. Rutledge Street, Springfield, IL 62702
TEL-217/782-9780; 217/524-6377 & 217/524-6378

Delivered by: PCE

Lab Sample # SF40329	VOC 8260	Metals 6010B	pH	Flash point				Field Sample #	Legal Hold?	Split?	# Bottles	Volume	Date Collected & Sealed	Time Collected (24 hr clock)	Time Sealed (24 hr clock)	Sampler's Initials	Collector or Laboratory Comments (Do not include personal identifier information for samples collected on private residential property.)	Seal Intact? (y/n)
-01	☒	☒	☒	☒	☐	☐	☐	X201	☒	☒	2	18 Oz.	June 5, 2014	12:04	12:10	PE MW	PE ~~S01~~ S1 F	
-02	☒	☒	☒	☒	☐	☐	☐	X202	☒	☒	2	18 Oz.	June 5, 2014	12:12	12:20	PE MW	S2 G	
-03	☒	☒	☒	☒	☐	☐	☐	X203	☒	☒	2	18 Oz.	June 5, 2014	12:47	12:51	PE MW	S3 H	
-04	☒	☒	☒	☒	☐	☐	☐	X204	☒	☒	2	18 Oz.	June 5, 2014	12:26	12:36	PE MW	S4 I	
-05	☒	☒	☒	☒	☐	☐	☐	X205	☒	☒	2	18 Oz.	June 5, 2014	12:52	12:59	PE MW	S5 J	
-06	☒	☒	☒	☒	☐	☐	☐	X206	☒	☒	2	18 Oz.	June 5, 2014	13:14	13:21	PE MW	S6 P	
-07	☒	☒	☒	☒	☐	☐	☐	X207	☒	☒	2	18 Oz.	June 5, 2014	13:22	13:31	PE MW	S7 R	
-08	☒	☒	☒	☒	☐	☐	☐	X208	☒	☒	2	18 Oz.	June 5, 2014	13:34	13:40	PE MW	S8 S	
-09	☒	☒	☒	☒	☐	☐	☐	X209	☒	☒	2	18 Oz.	June 5, 2014	13:42	13:50	PE MW	S9 T	
-12	☒	☐	☐	☐	☐	☐	☐	Trip Blanks	☒	☐	2	2.7 Oz.	June 5, 2014	XXXXXX	14:40	PE MW		

RECEIVED
SPRINGFIELD REGION
AUG 27 2014
Environmental Protection Agency
STATE OF ILLINOIS

Receipt for Samples: Collection of these sample(s) at the above-named site is hereby acknowledged. Split(s) Offered? ☐ Accepted? ☐

Signature/Title of Facility Representative, Date: Tim Kemper Tim Kemper ENG Tech. II Andrews Eng. 6/5/2014

Samplers (printed names and signatures):
Paul Eisenbrandt [signature]
MARK WEBER [signature]

Sealer: I certify that I sealed the samples listed above and I wrote my initials, the date, and the time on the seal(s).
Sealer's Signature: [signature] Date: 6/5/2014 Time (24 hr clock): 16:08

Carriers: I certify that I received the above sample(s) with the seal(s) intact and the sealer's initials and sealing date written on the seal(s).

Relinquished by (Sealer)	Date	Time (24 hr clock)	Received by	Date	Time (24 hr clock)

☐ To Container for Shipment

IL 532-2311
LPC 525
REV. 4/17/08

Laboratory Custodian: I certify that I received the above sample(s) with the seal integrity as indicated and the sealer's initials and the date written on the seal(s). After being received, this/these same sample(s) will be retained by laboratory personnel at all times or locked in a secured area.
Printed Name and Signature: Eric M. Bunch [signature] Date: ~~4602~~ EMB 6-5-14 6-5-14 Time (24 hr clock): 1600 Sample Temp. (°C): 11°

Signature of laboratory supervisor releasing results: [signature] Date: 8/5/14

Inorganic Laboratory Information

Organic Laboratory Information

INORGANIC PARAMETER GROUPS (Source of Methods: SW-846 except as noted)

CONSTITUENT	PWELL	GWTOT	GWT01	GWDIS	SURFW	TOTL1 TOTL2 TOTL3 TOTL4		TCLP1 TCLP2
Alkalinity	310.2[1]	310.2[1]	310.2[1]	310.2[1]	310.2[1]	—		—
Aluminum	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Ammonia-N	350.1[1]	350.1[1]	—	350.1[1]	350.1[1]	—		—
Antimony	200.8[1]	6020	—	6020	200.8[1]	6010B	1, 2, 3, 4	6010B
Arsenic	200.8[1]	6020	—	6020	200.8[1]	6010B	1, 2, 3, 4	6010B
Barium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	6010B
Beryllium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	6010B
Boron	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Cadmium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	6010B
Calcium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Chloride	325.2[1]	9251	9251	9251	325.2[1]	—		—
Chromium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	6010B
Cobalt	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Copper	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Cyanide	335.4[1]	9010B	9010B	—	335.4[1]	9010B	3, 4	—
Fluoride	380-75WE[2]	380-75WE[2]	380-75WE[2]	380-75WE[2]	380-75WE[2]	—		—
Hardness	200.7[1]	—	—	—	200.7[1]	—		—
Iron	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Lead	200.8[1]	6020	—	6020	200.8[1]	6010B	1, 2, 3, 4	6010B
Magnesium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Manganese	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Mercury	245.1[1]	7470A	—	7470A	245.1[1]	7470-1A*	1, 2, 3, 4	7470-1A*
Nickel	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	6010B
Nitrite/Nitrate	353.2[1]	353.2[1]	—	353.2[1]	353.2[1]	—		—
pH	150.1[1]	9040A	9040A	—	150.1[1]	9040A	3, 4	9040A
Phenols	420.4[1]	9066	9066	—	420.4[1]	9066	3, 4	—
Phosphorus	365.1[1]	365.1[1]	—	365.1[1]	365.1[1]	—		—
Potassium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Selenium	200.8[1]	6020	—	6020	200.8[1]	6010B	1, 2, 3, 4	6010B
Silver	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	6010B
Sodium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Sp. Cond	—	9050	9050	—	120.1[1]	—		—
Strontium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Sulfate	375.2[1]	9036	9036	9036	375.2[1]	—		—
Sulfide	376.1[1]	—	—	—	376.2[1]	—		—
Thallium	200.8[1]	6020	—	6020	200.8[1]	6010B	1, 2, 3, 4	6010B
TDS/ROE	160.1[1]	160.1[1]	160.1[1]	—	160.1[1]	—		—
TSS	—	—	—	—	160.2[1]	—		—
TOC	—	—	—	—	SM5310C	SM5310C	3, 4	—
Vanadium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	6010B
Zinc	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—

[1]EPA 821-C-99-004
[2]Technicon Industrial Methods

Numbers 1–4 correspond to groups TOTL1 through TOTL4. For example, TOTL1 contains all constituents that have a 1 listed after them, TOTL2 contains all constituents with a 2 listed after them, etc.

Also Method 1311

*Hg is 7470A for aqueous, 7471A for non-aqueous.

ORGANIC TEST GROUPS (Source of Methods: SW-846 except as noted)

VOC
Volatiles by GC/MS, Method 8260

VOC/DW
Drinking Water subset (D) by GC/MS, Method 524.2[1]

Compound	
1,1,1,2-Tetrachloroethane	
1,1,1-Trichloroethane	D
1,1,2,2-Tetrachloroethane	
1,1,2-Trichloroethane	D
1,1-Dichloroethane	
1,1-Dichloroethene	D
1,1-Dichloropropene	
1,2,3-Trichloropropane	
1,2-Dibromoethane	
1,2-Dichlorobenzene	D only
1,2-Dichloroethane	D
1,2-Dichloropropane	D
1,2,4-Trichlorobenzene	D only
1,3-Dichloropropane	
1,4-Dichlorobenzene	D only
2,2-Dichloropropane	
2-Butanone (MEK)	
2-Hexanone (MBK)	
4-Methyl-2-Pentanone (MIBK)	
Acetone	
Benzene	D
Bromobenzene	
Bromochloromethane	
Bromodichloromethane	
Bromoform	
Bromomethane	
Carbon Disulfide	
Carbon Tetrachloride	D
Chlorobenzene	D
Chloroethane	
Chloroform	
Chloromethane	
cis-1,2-Dichloroethene	D
cis-1,3-Dichloropropene	
Dibromochloromethane	
Dibromomethane	
Ethylbenzene	D
Isopropylbenzene	
m/p-Xylene	D
Methyl tert butyl ether (MTBE)	D
Methylene Chloride	D
o-Xylene	D
Styrene	D
Tetrachloroethene	D
Toluene	D
trans-1,2-Dichloroethene	D
trans-1,3-Dichloropropene	
Trichloroethene	D
Trichlorofluoromethane	
Vinyl Chloride	D
Xylene (Total)	D

[1]EPA 500-series Methods for the Determination of Organic Compounds in Drinking Water, Supplement I, II, and III

SVOC
Semivolatiles by GC/MS Method 8270

1,2,4,5-Tetrachlorobenzene
1,2,4-Trichlorobenzene
1,2-Dichlorobenzene
1,2-Dinitrobenzene
1,3-Dichlorobenzene
1,3-Dinitrobenzene
1,4-Dichlorobenzene
1,4-Dinitrobenzene
1-Chloronaphthalene
1-Naphthylamine
2,3,4,6-Tetrachlorophenol
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dichlorophenol
2,6-Dinitrotoluene
2-Chloronaphthalene
2-Chlorophenol
2-Methylnaphthalene
2-Methylphenol
2-Naphthylamine
2-Nitroaniline
2-Nitrophenol
2-Picoline
3,3'-Dichlorobenzidine
3-Nitroaniline
4,6-Dinitro-2-methylphenol
4-Bromophenylphenylether
4-Chloro-3-methylphenol
4-Chloroaniline
4-Chlorophenyl Phenyl Ether
4-Methylphenol
4-Nitroaniline
4-Nitrobiphenyl
4-Nitrophenol
5-Nitroacenaphthene
7,12-Dimethylbenzo(a)anthracene
Acenaphthylene
Acenapthene
Acetophenone
Anthracene
Azobenzene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Bis (2-chloroethoxy) Methane
Bis (2-chloroethyl) Ether
Bis (2-chloroisopropyl) Ether
Bis (2-ethylhexyl) Phthalate
Butyl Benzyl Phthalate
Carbazole
Chrysene
Dibenzo(a,h)anthracene
Dibenzofuran
Diethylphthalate
Dimethylphthalate
Di-n-butylphthalate
Di-n-octylphthalate
Diphenylamine
Ethylmethanesulfonate
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Hexachloropropene
Indeno(1,2,3-cd)pyrene
Isodrin
Isophorone
Isosafrole
Mestranol
Methylmethanesulfonate
Naphthalene
Nitrobenzene
n-Nitroso-di-n-butylamine
n-Nitroso-di-n-propylamine
n-Nitrosopiperidene
p-Dimethylaminoazobenzene
Pentachlorobenzene
Pentachloronitrobenzene
Pentachlorophenol
Phenacetin
Phenanthrene
Phenol
Pronamide
Pyrene
Pyridine
Safrole

ORGANIC BOTTLES

Test	Bottles Required (by Matrix): Water	Soil	Organic
VOC	(3) 40-ml vials[1,4]	(3)EnCore + 2 oz jar[1]	(1) 2 oz jar[1]
VOC/DW (drinking H_2O)	(3) 40-ml vials[1,4]	N/A	N/A
SVOC	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
PEST/ECD	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
PEST/NPD	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
PCB	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
HERB	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
HERB/DW (drinking H_2O)	(1) 1.25 liter bottle[1,2]	N/A	N/A
TOXAPHENE	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
TCLP VOC	(5) 40-ml vials[1,4]	(8) EnCore + 2 oz jar	(2) 2 oz jars
TCLP SVOC	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
TCLP PEST	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
TCLP HERB	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
FUEL ID	(1) 1.25 liter bottle[2]	(1) 8 oz jar[3]	(1) 8 oz jar
FLASH	N/A	N/A	(1) 8 oz jar
PAINTFILTER	N/A	(1) 8 oz jar	(1) 8 oz jar
pH	Any Container	Any Container	Any Container

Footnotes:

[1]For MS/MSD, from one sample point per twenty, collect two extra vials for VOCs and two extra bottles for each other parameter.

[2]1 test per bottle, except PEST/ECD & PCB can be run from the same bottle.

[3]Maximum of 2 tests from (1) 8 oz jar. Collect extra jar or use 16 oz jar for more than 2 tests.

[4]Requires (2) 40-ml trip blanks for up to 10 samples per cooler per day.

Bottle Descriptions:

40 mL glass vial, polypropylene cap with Teflon-lined silicone septum, 5 drops 50% HCl
1.25 L wide-mouth amber glass, polypropylene cap w/Teflon liner
2 oz glass, polypropylene cap w/Teflon liner
8 oz glass, polypropylene cap w/Teflon liner
16 oz glass, polypropylene cap w/Teflon liner
32 oz glass, polypropylene cap w/Teflon liner
5 g carbon polymer EnCore™ tube

40 ml = 1.35 oz

Assigning Field Numbers

Groundwater G
0/1/Alpha = Mon Well
2 = Private Well
3 = Spring
4 = Lysimeter
5 = Public Water Supply
6 = Recovery Well
7 = Injection Well
8 = Recovery Trench
9 = Irrigation Well
T = Till Well

Leachate L
1 = Flow or Seep
2 = Pond
3 = Collection System

Surface Water S
1 = Upstream
2 = Mid-Site
3 = Downstream
4 = Run-off
5 = Impounded
6 = Run-on

Special X
1 = Soil
2 = Waste
3 = Other

Examples:
G101 = Mon. Well Sample
X201 = Waste Sample
L201 = Leachate Pond Sample
S301 = Downstream Sample

INORGANIC PARAMETER GROUP DESCRIPTIONS

PWELL: Private wells. Bottles: Cyanide, Metals (unpres.), Nutrients, Phenol, Unpres. Plastic (16 oz)., Sulfide (32 oz). Total volume: 76 oz.

GWTOT: Groundwater monitoring wells. Bottles: Cyanide, Metals (pres.), Nutrients, Phenol, Unpres. Plastic (16 oz). Total volume: 44 oz.

GWT01: Groundwater monitoring wells w/o metals or nutrients. Bottles: Cyanide, Phenol, Unpres. Plastic (16 oz). Total volume: 32 oz.

GWDIS: Groundwater monitoring wells, *field-filtered*. Bottles: Metals (pres.), Nutrients, Unpres. Plastic (16 oz). Total volume: 28 oz.

SURFW: Surface waters and leachate flows. Bottles: Cyanide, Metals (unpres.), Nutrients, Phenol, Sulfide, Unpres. Plastic (64 oz). Total volume: 124 oz.

TOTL1: Aqueous wastes, wastewaters & leachate collection system samples, total metals only. Bottles: Metals (pres.). Total volume: 8 oz.

TOTL2: Waste, soil, sediment, sludge, and organic matrices, total metals only. Bottles: Unpres. Glass. Total volume: 16 oz.

TOTL3: Aqueous wastes, wastewaters and leachate collection system samples, total inorganics. Bottles: Cyanide, Metals (pres.), Nutrients, Phenol, Unpres. Plastic (16 oz). Total volume: 44 oz.

TOTL4: Waste, soil, sediment, sludge, and organic matrices, total inorganics. Bottles: Unpres. Glass. Total volume: 16 oz.

TCLP1: Aqueous wastes, wastewaters and leachate collection system samples, TCLP metals. Bottles: Unpres. Plastic (32 oz). Total volume: 32 oz.

TCLP2: Waste, soil, sediment, sludge, and organic matrices, TCLP metals. Bottles: Unpres. Glass. Total volume: 16 oz.

AWAST (same as TOTL3 + TCLP1): Bottles: Cyanide, Metals (pres.), Nutrients, Phenol, Unpres. Plastic (16 oz), *and* Unpres. Plastic (32 oz). Total volume: 76 oz.

SWAST (same as TOTL4 + TCLP2): Bottles: Unpres. Glass. Total volume: 16 oz.

OTHER TESTS

BOD (32 oz) — 405.1[1]
pH (50 ml) — 9040A[2]
SP. CONDUCTANCE (50 ml) — 9050[2]

Use unpreserved PE bottles; volume required listed after test name

[1]EPA-821-C-99-004
[2]SW-846

INORGANIC BOTTLES

CYANIDE: 8 oz PE, 1.25 ml 5N NaOH

METALS: 8 oz PE, 5 ml 50% HNO_3

METALS: 8 oz PE, unpreserved

NUTRIENTS: 4 oz PE, 1.25 ml 48% H_2SO_4

PHENOL: 8 oz glass, 1.8 ml 20% H_2SO_4

SULFIDE: 32 oz PE, 2 ml 2N $Zn(C_2H_3O_2)_2 \cdot H_2O$

UNPRESERVED PLASTIC: 16, 32, or 64 oz PE

UNPRESERVED GLASS: 16 oz (from Springfield Bottle Shop)

PE = Polyethylene bottle
glass = glass bottle
caps = polypropylene w/pulp & Saran liner except Nutrient (unlined)

PEST/ECD

Routine Pesticides/Herbicides by Electron Capture Detector Method 8081A

Acetochlor
Alachlor
Aldrin
Atrazine
alpha-BHC
gamma-BHC (Lindane)
Captan
alpha-Chlordane
gamma-Chlordane
Cyanazine
Dieldrin
Endrin
Heptachlor Epoxide
Heptachlor
Hexachlorobenzene
Methoxychlor
Metolachlor
Metribuzin
P,P'-DDE
P,P'-DDD
P,P'-DDT
Pendimethalin
Trifluralin

PEST/NPD

Routine Pesticides/ Herbicides by Nitrogen Phosphorous Detector Method 8141A

Atrazine
Butylate
Chlorpyrifos
Diazinon
EPTC
Fonofos
Malathion
Methyl Parathion
Phorate
Terbufos

HERB

Phenoxy Herbicides by Electron Capture Detector Method 8151A

HERB/DW

D = Drinking Water subset Method 515

2,4-D	D
2,4,5-TP (Silvex)	D
Acifluorfen	D only
Dalapon	D only
Dicamba	D only
Dinoseb	D only
Pentachlorophenol	D only
Picloram	D only

OTHER TESTS

TCLP VOC—1311+8260
TCLP SVOC—1311+8270
TCLP PEST—1311+8081A
TCLP HERB—1311+8151A
PCB—8082
pH—9040A
FLASHPOINT—1010
PAINTFILTER—9095
FUEL ID—1651
TOXAPHENE—8081A
Special Pesticides (request by name)

Brief Instructions for the Chain of Custody Document

1. Do not write in any areas shaded in gray. These are FOR LAB USE ONLY.
2. Complete form heading information: indicate funding code, complete file heading, indicate project manager (head sampler, who needs to receive the results) name, address, and phone number, circle or write receiving laboratory information, and indicate case number if this is for a criminal investigation.
3. In column heading areas under "Parameter Group and other analytes," list the parameter groups or other tests which will be requested. List each sample, one per row, under "Field Sample #." Then for each sample (row), check the required group or test, indicate whether the sample was split with the facility, whether it must be retained after analysis for evidentiary purposes, the number of bottles submitted, and the volume of the sample. Complete "Date Collected and Sealed" through "Collector or Laboratory Comments." "Collector or Laboratory Comments" may be used by the lab or inspector for miscellaneous comments. If more space is needed, attach a separate sheet of paper.
4. For the "Receipt for Samples" section, check boxes if splits were offered and/or accepted, then have the facility representative sign and put his/her title and the date in the indicated space. If he/she refuses, so note.
5. Complete "Samplers," "Sealer," and "Carriers" sections. If the sample is to be shipped, the last custodian relinquishing prior to shipping should check the "To container for shipment" box.

SW-846 = Test Methods for Evaluating Solid Waste EPA-821-C-99-004 = Methods and Guidance for Analysis of Water Technicon Industrial Methods = Fluoride in Water and Wastewater, Technicon Industrial Systems
EPA 500-series = Methods for the Determination of Organic Compounds in Drinking Water, Supplement I, II, and III.
SM5310C = Standard Methods for the Examination of Water and Wastewater, 20th edition
Information on this page is believed to be accurate but is not guaranteed.

R000695

Illinois EPA

Bureau of Land, DLPC/FOS
Chain of Custody Document
Page 1 of 1

Fund	BOL #	County	Locality
LP41	0210600007	Christian	Taylorville

Section	USEPA ID#	Site Name	File Category
F		Brandis Aircraft (The Paint Shop)	FOS

Paul Eisenbrandt, Inspector / Project Manager c/o IEPA
Springfield Field Staff – MC#10
1021 North Grand Avenue East
Springfield, IL 62794-9276 TEL-217/557-8761 FAX-217/557/-8728

IEPA Laboratory
825 N. Rutledge Street, Springfield, IL 62702
TEL-217/782-9780; 217/524-6377 & 217/524-6378

Delivered by
PCE

Lab Sample #	VOC 8260	Metals 6010B	pH	Flash point				Field Sample #	Legal Hold?	Split?	# Bottles	Volume	Date Collected & Sealed	Time Collected (24 hr clock)	Time Sealed (24 hr clock)	Sampler's Initials	Collector or Laboratory Comments (Do not include personal identifier information for samples collected on private residential property.)	Seal Intact? (y/n)
-10	☒	☒	☒	☒	☐	☐	☐	X210	☒	☒	2	18 oz.	June 5, 2014	13:50	13:57	PE MV	S10 V	
-11	☒	☒	☒	☒	☐	☐	☐	X211	☒	☒	2	18 oz.	June 5, 2014	14:20	14:26	PE MV	S11 W	
	☐	☐	☐	☐	☐	☐	☐		☐	☐								
	☐	☐	☐	☐	☐	☐	☐		☐	☐								
	☐	☐	☐	☐	☐	☐	☐		☐	☐							RECEIVED	
	☐	☐	☐	☐	☐	☐	☐		☐	☐							SPRINGFIELD REGION	
	☐	☐	☐	☐	☐	☐	☐		☐	☐							AUG 27 2014	
	☐	☐	☐	☐	☐	☐	☐		☐	☐							Environmental Protection Agency	
	☐	☐	☐	☐	☐	☐	☐		☐	☐							STATE OF ILLINOIS	
	☐	☐	☐	☐	☐	☐	☐		☐	☐								

Receipt for Samples: Collection of these sample(s) at the above-named site is hereby acknowledged. Split(s) Offered? ☐ Accepted? ☐

Tim Kemper Tim Kemper Eng. Tech. II Andrews Eng. 6/5/2014
Signature/Title of Facility Representative, Date

Samplers (printed names and signatures)
Paul Eisenbrandt Paul Eisenbrandt
MARK WEBER Mark Weber

Sealer: I certify that I sealed the samples listed above and I wrote my initials, the date, and the time on the seal(s).
Sealer's Signature Paul Eisenbrandt Date 6/5/2014 Time (24 hr clock) 16:08

Carriers: I certify that I received the above sample(s) with the seal(s) intact and the sealer's initials and sealing date written on the seal(s).

Relinquished by (Sealer)	Date	Time (24 hr clock)	Received by	Date	Time (24 hr clock)

☐ To Container for Shipment

IL 532-2311
LPC 525
REV. 4/17/08

Laboratory Custodian: I certify that I received the above sample(s) with the seal integrity as indicated and the sealer's initials and the date written on the seal(s). After being received, this/these same sample(s) will be retained by laboratory personnel at all times or locked in a secured area.

Printed Name and Signature	Date	Time (24 hr clock)	Sample Temp. (°C)
Eric M. Bunch E. M. Bunch	6-5-14	1600	11°

Signature of laboratory supervisor releasing results: [signature] Date: 8/5/14

Inorganic Laboratory Information

INORGANIC PARAMETER GROUPS (Source of Methods: SW-846 except as noted)

CONSTITUENT	PWELL	GWTOT	GWT01	GWDIS	SURFW	TOTL1 TOTL2 TOTL3 TOTL4		TCLP1 TCLP2
Alkalinity	310.2[1]	310.2[1]	310.2[1]	310.2[1]	310.2[1]	—		—
Aluminum	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Ammonia-N	350.1[1]	350.1[1]	—	350.1[1]	350.1[1]	—		—
Antimony	200.8[1]	6020	—	6020	200.8[1]	6010B	1, 2, 3, 4	6010B
Arsenic	200.8[1]	6020	—	6020	200.8[1]	6010B	1, 2, 3, 4	6010B
Barium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	6010B
Beryllium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	6010B
Boron	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Cadmium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	6010B
Calcium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Chloride	325.2[1]	9251	9251	9251	325.2[1]	—		—
Chromium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	6010B
Cobalt	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Copper	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Cyanide	335.4[1]	9010B	9010B	—	335.4[1]	9010B	3, 4	—
Fluoride	380-75WE[2]	380-75WE[2]	380-75WE[2]	380-75WE[2]	380-75WE[2]	—		—
Hardness	200.7[1]	—	—	—	200.7[1]	—		—
Iron	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Lead	200.8[1]	6020	—	6020	200.8[1]	6010B	1, 2, 3, 4	6010B
Magnesium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Manganese	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Mercury	245.1[1]	7470A	—	7470A	245.1[1]	7470-1A*	1, 2, 3, 4	7470-1A*
Nickel	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	6010B
Nitrite/Nitrate	353.2[1]	353.2[1]	—	353.2[1]	353.2[1]	—		—
pH	150.1[1]	9040A	9040A	—	150.1[1]	9040A	3, 4	9040A
Phenols	420.4[1]	9066	9066	—	420.4[1]	9066	3, 4	—
Phosphorus	365.1[1]	365.1[1]	—	365.1[1]	365.1[1]	—		—
Potassium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Selenium	200.8[1]	6020	—	6020	200.8[1]	6010B	1, 2, 3, 4	6010B
Silver	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	6010B
Sodium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Sp. Cond	—	9050	9050	—	120.1[1]	—		—
Strontium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—
Sulfate	375.2[1]	9036	9036	9036	375.2[1]	—		—
Sulfide	376.1[1]	—	—	—	376.2[1]	—		—
Thallium	200.8[1]	6020	—	6020	200.8[1]	6010B	1, 2, 3, 4	6010B
TDS/ROE	160.1[1]	160.1[1]	160.1[1]	—	160.1[1]	—		—
TSS	—	—	—	—	160.2[1]	—		—
TOC	—	—	—	—	SM5310C[3]	SM5310C	3, 4	—
Vanadium	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	6010B
Zinc	200.7[1]	6010B	—	6010B	200.7[1]	6010B	1, 2, 3, 4	—

[1]EPA 821-C-99-004
[2]Technicon Industrial Methods

Numbers 1–4 correspond to groups TOTL1 through TOTL4. For example, TOTL1 contains all constituents that have a 1 listed after them, TOTL2 contains all constituents with a 2 listed after them, etc.

Also Method 1311

*Hg is 7470A for aqueous, 7471A for non-aqueous

INORGANIC PARAMETER GROUP DESCRIPTIONS

PWELL: Private wells. Bottles: Cyanide, Metals (unpres.), Nutrients, Phenol, Unpres. Plastic (16 oz)., Sulfide (32 oz). Total volume: 76 oz.

GWTOT: Groundwater monitoring wells. Bottles: Cyanide, Metals (pres.), Nutrients, Phenol, Unpres. Plastic (16 oz). Total volume: 44 oz.

GWT01: Groundwater monitoring wells w/o metals or nutrients. Bottles: Cyanide, Phenol, Unpres. Plastic (16 oz). Total volume: 32 oz.

GWDIS: Groundwater monitoring wells, *field-filtered*. Bottles: Metals (pres.), Nutrients. Unpres. Plastic (16 oz). Total volume: 28 oz.

SURFW: Surface waters and leachate flows. Bottles: Cyanide, Metals (unpres.), Nutrients, Phenol, Sulfide, Unpres. Plastic (64 oz). Total volume: 124 oz.

TOTL1: Aqueous wastes, wastewaters & leachate collection system samples, total metals only. Bottles: Metals (pres.). Total volume: 8 oz.

TOTL2: Waste, soil, sediment, sludge, and organic matrices, total metals only. Bottles: Unpres. Glass. Total volume: 16 oz.

TOTL3: Aqueous wastes, wastewaters and leachate collection system samples, total inorganics. Bottles: Cyanide, Metals (pres.), Nutrients, Phenol, Unpres. Plastic (16 oz). Total volume: 44 oz.

TOTL4: Waste, soil, sediment, sludge, and organic matrices, total inorganics. Bottles: Unpres. Glass. Total volume: 16 oz.

TCLP1: Aqueous wastes, wastewaters and leachate collection system samples, TCLP metals. Bottles: Unpres. Plastic (32 oz). Total volume: 32 oz.

TCLP2: Waste, soil, sediment, sludge, and organic matrices, TCLP metals. Bottles: Unpres. Glass. Total volume: 16 oz.

AWAST (same as TOTL3 + TCLP1): Bottles: Cyanide, Metals (pres.), Nutrients, Phenol, Unpres. Plastic (16 oz), *and* Unpres. Plastic (32 oz). Total volume: 76 oz.

SWAST (same as TOTL4 + TCLP2): Bottles: Unpres. Glass. Total volume: 16 oz.

OTHER TESTS

BOD (32 oz) — 405.1[1]
pH (50 ml) — 9040A[2]
SP. CONDUCTANCE (50 ml) — 9050[2]

Use unpreserved PE bottles; volume required listed after test name

[1]EPA-821-C-99-004
[2]SW-846

Organic Laboratory Information

ORGANIC TEST GROUPS (Source of Methods: SW-846 except as noted)

VOC
Volatiles by GC/MS, Method 8260
VOC/DW
Drinking Water subset (D) by GC/MS, Method 524.2[1]

Compound	
1,1,1,2-Tetrachloroethane	
1,1,1-Trichloroethane	D
1,1,2,2-Tetrachloroethane	
1,1,2-Trichloroethane	D
1,1-Dichloroethane	
1,1-Dichloroethene	D
1,1-Dichloropropene	
1,2,3-Trichloropropane	
1,2-Dibromoethane	
1,2-Dichlorobenzene	D only
1,2-Dichloroethane	D
1,2-Dichloropropane	D
1,2,4-Trichlorobenzene	D only
1,3-Dichloropropane	
1,4-Dichlorobenzene	D only
2,2-Dichloropropane	
2-Butanone (MEK)	
2-Hexanone (MBK)	
4-Methyl-2-Pentanone (MIBK)	
Acetone	
Benzene	D
Bromobenzene	
Bromochloromethane	
Bromodichloromethane	
Bromoform	
Bromomethane	
Carbon Disulfide	
Carbon Tetrachloride	D
Chlorobenzene	D
Chloroethane	
Chloroform	
Chloromethane	
cis-1,2-Dichloroethene	D
cis-1,3-Dichloropropene	
Dibromochloromethane	
Dibromomethane	
Ethylbenzene	D
Isopropylbenzene	
m/p-Xylene	D
Methyl tert butyl ether (MTBE)	D
Methylene Chloride	D
o-Xylene	D
Styrene	D
Tetrachloroethene	D
Toluene	D
trans-1,2-Dichloroethene	D
trans-1,3-Dichloropropene	
Trichloroethene	D
Trichlorofluoromethane	
Vinyl Chloride	D
Xylene (Total)	D

[1]EPA 500-series Methods for the Determination of Organic Compounds in Drinking Water, Supplement I, II, and III

SVOC
Semivolatiles by GC/MS
Method 8270

1,2,4,5-Tetrachlorobenzene	Benzo(b)fluoranthene
1,2,4-Trichlorobenzene	Benzo(g,h,i)perylene
1,2-Dichlorobenzene	Benzo(k)fluoranthene
1,2-Dinitrobenzene	Bis (2-chloroethoxy) Methane
1,3-Dichlorobenzene	Bis (2-chloroethyl) Ether
1,3-Dinitrobenzene	Bis (2-chloroisopropyl) Ether
1,4-Dichlorobenzene	Bis (2-ethylhexyl) Phthalate
1,4-Dinitrobenzene	Butyl Benzyl Phthalate
1-Chloronaphthalene	Carbazole
1-Naphthylamine	Chrysene
2,3,4,6-Tetrachlorophenol	Dibenzo(a,h)anthracene
2,4,5-Trichlorophenol	Dibenzofuran
2,4,6-Trichlorophenol	Diethylphthalate
2,4-Dichlorophenol	Dimethylphthalate
2,4-Dimethylphenol	Di-n-butylphthalate
2,4-Dinitrophenol	Di-n-octylphthalate
2,4-Dinitrotoluene	Diphenylamine
2,6-Dichlorophenol	Ethylmethanesulfonate
2,6-Dinitrotoluene	Fluoranthene
2-Chloronaphthalene	Fluorene
2-Chlorophenol	Hexachlorobenzene
2-Methylnaphthalene	Hexachlorobutadiene
2-Methylphenol	Hexachlorocyclopentadiene
2-Naphthylamine	Hexachloroethane
2-Nitroaniline	Hexachloropropene
2-Nitrophenol	Indeno(1,2,3-cd)pyrene
2-Picoline	Isodrin
3,3'-Dichlorobenzidine	Isophorone
3-Nitroaniline	Isosafrole
4,6-Dinitro-2-methylphenol	Mestranol
4-Bromophenylphenylether	Methylmethanesulfonate
4-Chloro-3-methylphenol	Naphthalene
4-Chloroaniline	Nitrobenzene
4-Chlorophenyl Phenyl Ether	n-Nitroso-di-n-butylamine
4-Methylphenol	n-Nitroso-di-n-propylamine
4-Nitroaniline	n-Nitrosopiperidene
4-Nitrobiphenyl	p-Dimethylaminoazobenzene
4-Nitrophenol	Pentachlorobenzene
5-Nitroacenaphthene	Pentachloronitrobenzene
7,12-Dimethylbenzo(a)anthracene	Pentachlorophenol
Acenaphthylene	Phenacetin
Acenaphthene	Phenanthrene
Acetophenone	Phenol
Anthracene	Pronamide
Azobenzene	Pyrene
Benzo(a)anthracene	Pyridine
Benzo(a)pyrene	Safrole

ORGANIC BOTTLES

Test	Bottles Required (by Matrix): Water	Soil	Organic
VOC	(3) 40-ml vials[1,4]	(3)EnCore + 2 oz jar[3]	(1) 2 oz jar[3]
VOC/DW (drinking H_2O)	(3) 40-ml vials[1,4]	N/A	N/A
SVOC	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
PEST/ECD	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
PEST/NPD	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
PCB	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
HERB	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
HERB/DW (drinking H_2O)	(1) 1.25 liter bottle[1,2]	N/A	N/A
TOXAPHENE	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
TCLP VOC	(5) 40-ml vials[4]	(8) EnCore + 2 oz jar	(2) 2 oz jars
TCLP SVOC	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
TCLP PEST	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
TCLP HERB	(1) 1.25 liter bottle[1,2]	(1) 8 oz jar[3]	(1) 8 oz jar
FUEL ID	(1) 1.25 liter bottle[2]	(1) 8 oz jar[3]	(1) 8 oz jar
FLASH	N/A	N/A	(1) 8 oz jar
PAINTFILTER	N/A	(1) 8 oz jar	(1) 8 oz jar
pH	Any Container	Any Container	Any Container

Footnotes:
[1]For MS/MSD, from one sample point per twenty, collect two extra vials for VOCs and two extra bottles for each other parameter.
[2]1 test per bottle, except PEST/ECD & PCB can be run from the same bottle.
[3]Maximum of 2 tests from (1) 8 oz jar. Collect extra jar or use 16 oz jar for more than 2 tests.
[4]Requires (2) 40-ml trip blanks for up to 10 samples per cooler per day.

Bottle Descriptions:
40 ml glass vial, polypropylene cap with Teflon-lined silicone septum, 5 drops 50% HCl
1.25 L wide-mouth amber glass, polypropylene cap w/Teflon liner
2 oz glass, polypropylene cap w/Teflon liner
8 oz glass, polypropylene cap w/Teflon liner
16 oz glass, polypropylene cap w/Teflon liner
32 oz glass, polypropylene cap w/Teflon liner
5 g carbon polymer EnCore™ tube

40 ml = 1.35 oz

Assigning Field Numbers

Groundwater G
0/1/Alpha = Mon Well
2 = Private Well
3 = Spring
4 = Lysimeter
5 = Public Water Supply
6 = Recovery Well
7 = Injection Well
8 = Recovery Trench
9 = Irrigation Well
T = Till Well

Leachate L
1 = Flow or Seep
2 = Pond
3 = Collection System

Surface Water S
1 = Upstream
2 = Mid-Site
3 = Downstream
4 = Run-off
5 = Impounded
6 = Run-on

Special X
1 = Soil
2 = Waste
3 = Other

Examples:
G101 = Mon. Well Sample
X201 = Waste Sample
L201 = Leachate Pond Sample
S301 = Downstream Sample

INORGANIC BOTTLES

CYANIDE: 8 oz PE, 1.25 ml 5N NaOH
METALS: 8 oz PE, 5 ml 50% HNO_3
METALS: 8 oz PE, unpreserved
NUTRIENTS: 4 oz PE, 1.25 ml 48% H_2SO_4
PHENOL: 8 oz glass, 1.8 ml 20% H_2SO_4
SULFIDE: 32 oz PE, 2 ml 2N $Zn(C_2H_3O_2)_2 H_2O$
UNPRESERVED PLASTIC: 16, 32, or 64 oz PE
UNPRESERVED GLASS: 16 oz (from Springfield Bottle Shop)

PE = Polyethylene bottle
glass = glass bottle
caps = polypropylene w/pulp & Saran liner except Nutrient (unlined)

PEST/ECD
Routine Pesticides/Herbicides by Electron Capture Detector Method 8081A

Acetochlor
Alachlor
Aldrin
Atrazine
alpha-BHC
gamma-BHC (Lindane)
Captan
alpha-Chlordane
gamma-Chlordane
Cyanazine
Dieldrin
Endrin
Heptachlor Epoxide
Heptachlor
Hexachlorobenzene
Methoxychlor
Metolachlor
Metribuzin
P,P'-DDE
P,P'-DDD
P,P'-DDT
Pendimethalin
Trifluralin

PEST/NPD
Routine Pesticides/Herbicides by Nitrogen Phosphorous Detector Method 8141A

Atrazine
Butylate
Chlorpyrifos
Diazinon
EPTC
Fonofos
Malathion
Methyl Parathion
Phorate
Terbufos

HERB
Phenoxy Herbicides by Electron Capture Detector Method 8151A
HERB/DW
D = Drinking Water subset Method 515

2,4-D	D
2,4,5-TP (Silvex)	D
Acifluorfen	D only
Dalapon	D only
Dicamba	D only
Dinoseb	D only
Pentachlorophenol	D only
Picloram	D only

OTHER TESTS

TCLP VOC—1311 + 8260
TCLP SVOC—1311 + 8270
TCLP PEST—1311 + 8081A
TCLP HERB—1311 + 8151A
PCB—8082
pH—9040A
FLASHPOINT—1010
PAINTFILTER—9095
FUEL ID—1651
TOXAPHENE—8081A
Special Pesticides (request by name)

Brief Instructions for the Chain of Custody Document

1. Do not write in any areas shaded in gray. These are FOR LAB USE ONLY.
2. Complete form heading information: indicate funding code, complete file heading, indicate project manager (head sampler, who needs to receive the results) name, address, and phone number, circle or write receiving laboratory information, and indicate case number if this is for a criminal investigation.
3. In column heading areas under "Parameter Group and other analytes," list the parameter groups or other tests which will be requested. List each sample, one per row, under "Field Sample #." Then for each sample (row), check the required group or test, indicate whether the sample was split with the facility, whether it must be retained after analysis for evidentiary purposes, the number of bottles submitted, and the volume of the sample. Complete "Date Collected and Sealed" through "Collector or Laboratory Comments." "Collector or Laboratory Comments" may be used by the lab or inspector for miscellaneous comments. If more space is needed, attach a separate sheet of paper.
4. For the "Receipt for Samples" section, check boxes if splits were offered and/or accepted, then have the facility representative sign and put his/her title and the date in the indicated space. If he/she refuses, so note.
5. Complete "Samplers, "Sealer," and "Carriers" sections. If the sample is to be shipped, the last custodian relinquishing prior to shipping should check the "To container for shipment" box.

R000696

SW-846 = Test Methods for Evaluating Solid Waste   EPA-821-C-99-004 = Methods and Guidance for Analysis of Water   Technicon Industrial Methods = Fluoride in Water and Wastewater, Technicon Industrial Systems
EPA 500-series = Methods for the Determination of Organic Compounds In Drinking Water, Supplement I, II, and III.
SM5310C = Standard Methods for the Examination of Water and Wastewater, 20th edition
Information on this page is believed to be accurate but is not guaranteed.

Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0
Client Sample ID:	**X201**			Lab Sample ID:	**SF40329-01**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:04
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/12/14 11:16

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		1000	
Vinyl chloride	ND		1000	
Bromomethane	ND		1000	
Chloroethane	ND		1000	
Trichlorofluoromethane	ND		1000	
Acetone	**16000**		5000	
1,1-Dichloroethene	ND		1000	
Methylene chloride	**14000000**		1000000	
Carbon disulfide	ND		1000	
trans-1,2-Dichloroethene	ND		1000	
Methyl tert-butyl ether	**5300**		1000	
1,1-Dichloroethane	ND		1000	
2-Butanone (MEK) *	**10000**		5000	
cis-1,2-Dichloroethene	ND		1000	
Bromochloromethane	**1600**		1000	
Chloroform	ND		1000	
2,2-Dichloropropane	ND		1000	
1,2-Dichloroethane	ND		1000	
1,1,1-Trichloroethane	ND		1000	
1,1-Dichloropropene	ND		1000	
Carbon tetrachloride	ND		1000	
Benzene	ND		1000	
Dibromomethane	ND		1000	
1,2-Dichloropropane	ND		1000	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0
Client Sample ID:	**X201**			Lab Sample ID:	**SF40329-01**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:04
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/12/14 11:16

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		1000	
Bromodichloromethane	ND		1000	
cis-1,3-Dichloropropene	ND		1000	
4-Methyl-2-pentanone (MIBK)	ND		1000	
trans-1,3-Dichloropropene	ND		1000	
1,1,2-Trichloroethane	ND		1000	
Toluene	**47000**		1000	
1,3-Dichloropropane	ND		1000	
2-Hexanone (MBK) *	ND		1000	
Dibromochloromethane	ND		1000	
1,2-Dibromoethane	ND		1000	
Tetrachloroethene	ND		1000	
1,1,1,2-Tetrachloroethane	ND		1000	
Chlorobenzene	ND		1000	
Ethylbenzene	ND		1000	
Bromoform	ND		1000	
Styrene	ND		1000	
1,1,2,2-Tetrachloroethane	ND		1000	
Xylenes, total	ND		1000	
1,2,3-Trichloropropane	ND		1000	
Isopropylbenzene	ND		1000	
Bromobenzene	ND		1000	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0
Client Sample ID:	**X201**			Lab Sample ID:	**SF40329-01**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:04
Sample Type:		Sample Depth:		Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/16/14 12:00
Units:	°F	Analyzed:	06/16/14 12:00

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:33

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**23900**		60.0	40000
Antimony	**120**		10.0	
Arsenic *	ND	J3	10.0	
Barium	**179**		5.00	
Beryllium	ND		1.00	
Boron	**264**		10.0	
Cadmium	**4650**		3.00	
Calcium	**805000**		300	100000
Chromium	**11800**		5.00	
Cobalt	**29.3**		10.0	
Copper	**82.9**		10.0	
Iron	**8690**		50.0	40000
Lead	**132**		5.00	
Magnesium	**54900**		300	100000
Manganese	**3110**		15.0	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X201**		Lab Sample ID:	**SF40329-01**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 12:04
Sample Type:		Sample Depth:	Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:33

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	**212**		5.00	
Potassium	**46500**		1400	100000
Selenium *	**33.9**		10.0	
Silver	ND		3.00	
Sodium	**191000**		300	
Strontium	**26200**		5.00	
Thallium	**10.7**		10.0	
Vanadium	**14.3**		5.00	
Zinc	**24600**		25.0	
Hardness	**2130000**		1980	

pH

Method:	150.1	Prepared:	07/07/14 12:15
Units:	PH	Analyzed:	07/07/14 13:52

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**3.1**	Q	0.0	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X202**		Lab Sample ID:	**SF40329-02**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 12:12
Sample Type:		Sample Depth:	Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/12/14 13:50

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		200000	
Vinyl chloride	ND		200000	
Bromomethane	ND		200000	
Chloroethane	ND		200000	
Trichlorofluoromethane	ND		200000	
Acetone	ND		1000000	
1,1-Dichloroethene	ND		200000	
Methylene chloride	**6500000**		500000	
Carbon disulfide	ND		200000	
trans-1,2-Dichloroethene	ND		200000	
Methyl tert-butyl ether	ND		200000	
1,1-Dichloroethane	ND		200000	
2-Butanone (MEK) *	ND		1000000	
cis-1,2-Dichloroethene	ND		200000	
Bromochloromethane	ND		200000	
Chloroform	ND		200000	
2,2-Dichloropropane	ND		200000	
1,2-Dichloroethane	ND		200000	
1,1,1-Trichloroethane	ND		200000	
1,1-Dichloropropene	ND		200000	
Carbon tetrachloride	ND		200000	
Benzene	ND		200000	
Dibromomethane	ND		200000	
1,2-Dichloropropane	ND		200000	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0
Client Sample ID:	**X202**			Lab Sample ID:	**SF40329-02**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:12
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/12/14 13:50

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		200000	
Bromodichloromethane	ND		200000	
cis-1,3-Dichloropropene	ND		200000	
4-Methyl-2-pentanone (MIBK)	ND		200000	
trans-1,3-Dichloropropene	ND		200000	
1,1,2-Trichloroethane	ND		200000	
Toluene	ND		200000	
1,3-Dichloropropane	ND		200000	
2-Hexanone (MBK) *	ND		200000	
Dibromochloromethane	ND		200000	
1,2-Dibromoethane	ND		200000	
Tetrachloroethene	ND		200000	
1,1,1,2-Tetrachloroethane	ND		200000	
Chlorobenzene	ND		200000	
Ethylbenzene	ND		200000	
Bromoform	ND		200000	
Styrene	ND		200000	
1,1,2,2-Tetrachloroethane	ND		200000	
Xylenes, total	ND		200000	
1,2,3-Trichloropropane	ND		200000	
Isopropylbenzene	ND		200000	
Bromobenzene	ND		200000	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X202**		Lab Sample ID:	**SF40329-02**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 12:12
Sample Type:		Sample Depth:	Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/16/14 12:00
Units:	°F	Analyzed:	06/16/14 12:00

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:37

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**13200**		60.0	40000
Antimony	**112**		10.0	
Arsenic *	ND		10.0	
Barium	**139**		5.00	
Beryllium	**1.19**		1.00	
Boron	**270**		10.0	
Cadmium	**6230**		3.00	
Calcium	**946000**		300	100000
Chromium	**12700**		5.00	
Cobalt	**24.8**		10.0	
Copper	**420**		10.0	
Iron	**6110**		50.0	40000
Lead	**52.9**		5.00	
Magnesium	**52800**		300	100000
Manganese	**2330**		15.0	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X202**		Lab Sample ID:	**SF40329-02**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 12:12
Sample Type:		Sample Depth:	Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:37

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	**231**		5.00	
Potassium	**23900**		1400	100000
Selenium *	**10.5**		10.0	
Silver	ND		3.00	
Sodium	**189000**		300	
Strontium	**27700**		5.00	
Thallium	ND		10.0	
Vanadium	ND		5.00	
Zinc	**24000**		25.0	
Hardness	**2290000**		1980	

pH

Method:	150.1	Prepared:	07/07/14 12:15
Units:	PH	Analyzed:	07/07/14 13:52

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**3.1**	Q	0.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X203**		Lab Sample ID:	**SF40329-03**
Matrix:	Solid	Collected By: PE/MW	Date/Time Collected:	06/05/14 12:47
Sample Type:		Sample Depth:	Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/kg wet	Analyzed:	06/17/14 11:31

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		200	
Vinyl chloride	ND		200	
Bromomethane	ND		200	
Chloroethane	ND		200	
Trichlorofluoromethane	ND		200	
Acetone	ND		1000	
1,1-Dichloroethene	ND		200	
Methylene chloride	**16000000**		500000	
Carbon disulfide	ND		200	
trans-1,2-Dichloroethene	ND		200	
Methyl tert-butyl ether	ND		200	
1,1-Dichloroethane	ND		200	
2-Butanone (MEK) *	**3500**		1000	
cis-1,2-Dichloroethene	ND		200	
Bromochloromethane	**440**		200	
Chloroform	ND		200	
2,2-Dichloropropane	ND		200	
1,2-Dichloroethane	ND		200	
1,1,1-Trichloroethane	ND		200	
1,1-Dichloropropene	ND		200	
Carbon tetrachloride	ND		200	
Benzene	ND		200	
Dibromomethane	ND		200	
1,2-Dichloropropane	ND		200	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0
Client Sample ID:	**X203**			Lab Sample ID:	**SF40329-03**
Matrix:	Solid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:47
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/kg wet	Analyzed:	06/17/14 11:31

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	**2100**		200	
Bromodichloromethane	ND		200	
cis-1,3-Dichloropropene	ND		200	
4-Methyl-2-pentanone (MIBK)	**290**		200	
trans-1,3-Dichloropropene	ND		200	
1,1,2-Trichloroethane	ND		200	
Toluene	**6500000**	J1	200000	
1,3-Dichloropropane	ND		200	
2-Hexanone (MBK) *	ND		200	
Dibromochloromethane	ND		200	
1,2-Dibromoethane	ND		200	
Tetrachloroethene	**1900**		200	
1,1,1,2-Tetrachloroethane	ND		200	
Chlorobenzene	**620**		200	
Ethylbenzene	**570**		200	
Bromoform	ND		200	
Styrene	**210**		200	
1,1,2,2-Tetrachloroethane	ND		200	
Xylenes, total	**2600**		200	
1,2,3-Trichloropropane	ND		200	
Isopropylbenzene	ND		200	
Bromobenzene	ND		200	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0
Client Sample ID:	**X203**			Lab Sample ID:	**SF40329-03**
Matrix:	Solid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:47
Sample Type:		Sample Depth:		Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/18/14 10:30
Units:	°F	Analyzed:	06/18/14 10:30

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA Method 6010 - ICP

Method:	SW-846 6010	Prepared:	06/10/14 13:26
Units:	mg/kg wet	Analyzed:	06/18/14 13:09

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**6100**		9.26	
Arsenic *	ND	B1, J3	1.85	
Barium	**1370**		0.46	
Beryllium	ND		0.09	
Boron	ND	B2	4.63	
Cadmium	**36.1**	B2	0.46	
Calcium	**2970**		27.8	
Chromium	**1600**		0.46	
Cobalt	**1.34**		0.93	
Copper	**97.7**	B1	0.93	
Iron	**4720**		92.6	
Lead	**699**	B1	0.46	
Magnesium	**1090**		46.3	
Manganese	**71.8**		1.39	
Nickel	**13.0**		0.46	

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825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X203**		Lab Sample ID:	**SF40329-03**
Matrix:	Solid	Collected By: PE/MW	Date/Time Collected:	06/05/14 12:47
Sample Type:		Sample Depth:	Total Depth:	0

Metals by EPA Method 6010 - ICP

Method:	SW-846 6010	Prepared:	06/10/14 13:26
Units:	mg/kg wet	Analyzed:	06/18/14 13:09

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Potassium	ND		185	
Silver	**0.47**		0.46	
Sodium	**388**		185	
Strontium	**1250**		0.46	
Vanadium	**4.36**		0.46	
Zinc	**331**		4.63	
Antimony	**15.7**	J3	1.85	
Selenium *	ND	B1	1.85	
Thallium	ND		1.85	

pH

Method:	150.1	Prepared:	08/01/14 15:08
Units:	PH	Analyzed:	08/01/14 15:10

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**4.0**	Q	0.0	

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825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**		
Project/Facility Number:	0210600007	Date Received :	06/05/14
Funding Code:	LP41	Visit Number:	
Trip ID:		Temperature C:	11.0

Client Sample ID:	**X204**			Lab Sample ID:	**SF40329-04**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:26
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 12:50

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		20000	
Vinyl chloride	ND		20000	
Bromomethane	ND		20000	
Chloroethane	ND		20000	
Trichlorofluoromethane	ND		20000	
Acetone	ND		100000	
1,1-Dichloroethene	ND		20000	
Methylene chloride	**630000**		50000	
Carbon disulfide	ND		20000	
trans-1,2-Dichloroethene	ND		20000	
Methyl tert-butyl ether	ND		20000	
1,1-Dichloroethane	ND		20000	
2-Butanone (MEK) *	**220000**		100000	
cis-1,2-Dichloroethene	ND		20000	
Bromochloromethane	ND		20000	
Chloroform	ND		20000	
2,2-Dichloropropane	ND		20000	
1,2-Dichloroethane	ND		20000	
1,1,1-Trichloroethane	ND		20000	
1,1-Dichloropropene	ND		20000	
Carbon tetrachloride	ND		20000	
Benzene	ND		20000	
Dibromomethane	ND		20000	
1,2-Dichloropropane	ND		20000	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0
Client Sample ID:	**X204**			Lab Sample ID:	**SF40329-04**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 12:26
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 12:50

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		20000	
Bromodichloromethane	ND		20000	
cis-1,3-Dichloropropene	ND		20000	
4-Methyl-2-pentanone (MIBK)	ND		20000	
trans-1,3-Dichloropropene	ND		20000	
1,1,2-Trichloroethane	ND		20000	
Toluene	**39000**		20000	
1,3-Dichloropropane	ND		20000	
2-Hexanone (MBK) *	ND		20000	
Dibromochloromethane	ND		20000	
1,2-Dibromoethane	ND		20000	
Tetrachloroethene	ND		20000	
1,1,1,2-Tetrachloroethane	ND		20000	
Chlorobenzene	ND		20000	
Ethylbenzene	ND		20000	
Bromoform	ND		20000	
Styrene	ND		20000	
1,1,2,2-Tetrachloroethane	ND		20000	
Xylenes, total	ND		20000	
1,2,3-Trichloropropane	ND		20000	
Isopropylbenzene	ND		20000	
Bromobenzene	ND		20000	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X204**		Lab Sample ID:	**SF40329-04**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 12:26
Sample Type:		Sample Depth:	Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/16/14 12:00
Units:	°F	Analyzed:	06/16/14 12:00

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:42

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**11900**		60.0	40000
Antimony	**308**		10.0	
Arsenic *	ND		10.0	
Barium	**474**		5.00	
Beryllium	ND		1.00	
Boron	**299**		10.0	
Cadmium	**2270**		3.00	
Calcium	**519000**		300	100000
Chromium	**37800**		5.00	
Cobalt	**23.8**		10.0	
Copper	**283**		10.0	
Iron	**1190**		50.0	40000
Lead	**63.0**		5.00	
Magnesium	**45100**		300	100000
Manganese	**2130**		15.0	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X204**		Lab Sample ID:	**SF40329-04**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 12:26
Sample Type:		Sample Depth:	Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:42

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	**128**		5.00	
Potassium	**10100**		1400	100000
Selenium *	**16.8**		10.0	
Silver	ND		3.00	
Sodium	**108000**		300	
Strontium	**64100**		5.00	
Thallium	ND		10.0	
Vanadium	ND		5.00	
Zinc	**5470**		25.0	
Hardness	**1280000**		1980	

pH

Method:	150.1	Prepared:	07/07/14 12:15
Units:	PH	Analyzed:	07/07/14 13:52

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**3.4**	Q	0.0	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X205**		Lab Sample ID:	**SF40329-05**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 12:52
Sample Type:		Sample Depth:	Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 13:21

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		20000	
Vinyl chloride	ND		20000	
Bromomethane	ND		20000	
Chloroethane	ND		20000	
Trichlorofluoromethane	ND		20000	
Acetone	ND		1000000	
1,1-Dichloroethene	ND		20000	
Methylene chloride	**3900000**		500000	
Carbon disulfide	ND		20000	
trans-1,2-Dichloroethene	ND		20000	
Methyl tert-butyl ether	ND		20000	
1,1-Dichloroethane	ND		20000	
2-Butanone (MEK) *	ND		100000	
cis-1,2-Dichloroethene	ND		20000	
Bromochloromethane	ND		20000	
Chloroform	ND		20000	
2,2-Dichloropropane	ND		20000	
1,2-Dichloroethane	ND		20000	
1,1,1-Trichloroethane	ND		20000	
1,1-Dichloropropene	ND		20000	
Carbon tetrachloride	ND		20000	
Benzene	ND		20000	
Dibromomethane	ND		20000	
1,2-Dichloropropane	ND		20000	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X205**		Lab Sample ID:	**SF40329-05**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 12:52
Sample Type:		Sample Depth:	Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 13:21

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		20000	
Bromodichloromethane	ND		20000	
cis-1,3-Dichloropropene	ND		20000	
4-Methyl-2-pentanone (MIBK)	ND		20000	
trans-1,3-Dichloropropene	ND		20000	
1,1,2-Trichloroethane	ND		20000	
Toluene	**96000**		20000	
1,3-Dichloropropane	ND		20000	
2-Hexanone (MBK) *	ND		20000	
Dibromochloromethane	ND		20000	
1,2-Dibromoethane	ND		20000	
Tetrachloroethene	ND		20000	
1,1,1,2-Tetrachloroethane	ND		20000	
Chlorobenzene	ND		20000	
Ethylbenzene	ND		20000	
Bromoform	ND		20000	
Styrene	ND		20000	
1,1,2,2-Tetrachloroethane	ND		20000	
Xylenes, total	ND		20000	
1,2,3-Trichloropropane	ND		20000	
Isopropylbenzene	ND		20000	
Bromobenzene	ND		20000	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X205**		Lab Sample ID:	**SF40329-05**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 12:52
Sample Type:		Sample Depth:	Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/18/14 10:30
Units:	°F	Analyzed:	06/18/14 10:30

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:46

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**17400**		60.0	40000
Antimony	**143**		10.0	
Arsenic *	ND		10.0	
Barium	**428**		5.00	
Beryllium	ND		1.00	
Boron	**311**		10.0	
Cadmium	**1620**		3.00	
Calcium	**369000**		300	100000
Chromium	**17700**		5.00	
Cobalt	**20.9**		10.0	
Copper	**201**		10.0	
Iron	**6130**		50.0	40000
Lead	**49.8**		5.00	
Magnesium	**37700**		300	100000
Manganese	**1640**		15.0	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X205**		Lab Sample ID:	**SF40329-05**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 12:52
Sample Type:		Sample Depth:	Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:46

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	**92.2**		5.00	
Potassium	**9830**		1400	100000
Selenium *	**30.2**		10.0	
Silver	ND		3.00	
Sodium	**133000**		300	
Strontium	**33800**		5.00	
Thallium	ND		10.0	
Vanadium	ND		5.00	
Zinc	**5530**		25.0	
Hardness	**1080000**		1980	

pH

Method:	150.1	Prepared:	07/07/14 12:15
Units:	PH	Analyzed:	07/07/14 13:52

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**3.1**	Q	0.0	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X206**		Lab Sample ID:	**SF40329-06**
Matrix:	Solid	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:14
Sample Type:		Sample Depth:	Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/kg wet	Analyzed:	06/17/14 13:51

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND	J1	17000	
Vinyl chloride	ND	J1	17000	
Bromomethane	ND	J1	17000	
Chloroethane	ND	J1	17000	
Trichlorofluoromethane	ND	J1	17000	
Acetone	ND	J1	86000	
1,1-Dichloroethene	ND	J1	17000	
Methylene chloride	**920000**	J1	43000	
Carbon disulfide	ND	J1	17000	
trans-1,2-Dichloroethene	ND	J1	17000	
Methyl tert-butyl ether	ND	J1	17000	
1,1-Dichloroethane	ND	J1	17000	
2-Butanone (MEK) *	**180000**	J1	86000	
cis-1,2-Dichloroethene	ND	J1	17000	
Bromochloromethane	ND	J1	17000	
Chloroform	ND	J1	17000	
2,2-Dichloropropane	ND	J1	17000	
1,2-Dichloroethane	ND	J1	17000	
1,1,1-Trichloroethane	ND	J1	17000	
1,1-Dichloropropene	ND	J1	17000	
Carbon tetrachloride	ND	J1	17000	
Benzene	ND	J1	17000	
Dibromomethane	ND	J1	17000	
1,2-Dichloropropane	ND	J1	17000	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0
Client Sample ID:	**X206**			Lab Sample ID:	**SF40329-06**
Matrix:	Solid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:14
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/kg wet	Analyzed:	06/17/14 13:51

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND	J1	17000	
Bromodichloromethane	ND	J1	17000	
cis-1,3-Dichloropropene	ND	J1	17000	
4-Methyl-2-pentanone (MIBK)	ND	J1	17000	
trans-1,3-Dichloropropene	ND	J1	17000	
1,1,2-Trichloroethane	ND	J1	17000	
Toluene	**6700000**	J1	170000	
1,3-Dichloropropane	ND	J1	17000	
2-Hexanone (MBK) *	ND	J1	17000	
Dibromochloromethane	ND	J1	17000	
1,2-Dibromoethane	ND	J1	17000	
Tetrachloroethene	ND	J1	17000	
1,1,1,2-Tetrachloroethane	ND	J1	17000	
Chlorobenzene	ND	J1	17000	
Ethylbenzene	ND	J1	17000	
Bromoform	ND	J1	17000	
Styrene	ND	J1	17000	
1,1,2,2-Tetrachloroethane	ND	J1	17000	
Xylenes, total	ND	J1	17000	
1,2,3-Trichloropropane	ND	J1	17000	
Isopropylbenzene	ND	J1	17000	
Bromobenzene	ND	J1	17000	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X206**		Lab Sample ID:	**SF40329-06**
Matrix:	Solid	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:14
Sample Type:		Sample Depth:	Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/18/14 10:30
Units:	°F	Analyzed:	06/18/14 10:30

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA Method 6010 - ICP

Method:	SW-846 6010	Prepared:	06/10/14 13:26
Units:	mg/kg wet	Analyzed:	06/18/14 13:16

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**6170**		9.43	
Arsenic *	ND	B1	1.89	
Barium	**1400**		0.47	
Beryllium	ND		0.09	
Boron	ND	B2	4.72	
Cadmium	**119**	B2	0.47	
Calcium	**6270**		28.3	
Chromium	**1630**		0.47	
Cobalt	**1.68**		0.94	
Copper	**113**	B1	0.94	
Iron	**13200**		94.3	
Lead	**680**	B1	0.47	
Magnesium	**1510**		47.2	
Manganese	**81.2**		1.42	
Nickel	**21.5**		0.47	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0
Client Sample ID:	**X206**			Lab Sample ID:	**SF40329-06**
Matrix:	Solid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:14
Sample Type:		Sample Depth:		Total Depth:	0

Metals by EPA Method 6010 - ICP

Method:	SW-846 6010	Prepared:	06/10/14 13:26
Units:	mg/kg wet	Analyzed:	06/18/14 13:16

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Potassium	**189**		189	
Silver	ND		0.47	
Sodium	**267**		189	
Strontium	**1430**		0.47	
Vanadium	**3.43**		0.47	
Zinc	**744**		4.72	
Antimony	**16.4**		1.89	
Selenium *	ND	B1	1.89	
Thallium	ND		1.89	

pH

Method:	150.1	Prepared:	08/01/14 15:08
Units:	PH	Analyzed:	08/01/14 15:10

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**5.8**	Q	0.0	

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Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X207**		Lab Sample ID:	**SF40329-07**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:22
Sample Type:		Sample Depth:	Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/16/14 14:53

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		20000	
Vinyl chloride	ND		20000	
Bromomethane	ND		20000	
Chloroethane	ND		20000	
Trichlorofluoromethane	ND		20000	
Acetone	ND		100000	
1,1-Dichloroethene	ND		20000	
Methylene chloride	**550000**		50000	
Carbon disulfide	ND		20000	
trans-1,2-Dichloroethene	ND		20000	
Methyl tert-butyl ether	ND		20000	
1,1-Dichloroethane	ND		20000	
2-Butanone (MEK) *	ND		100000	
cis-1,2-Dichloroethene	ND		20000	
Bromochloromethane	ND		20000	
Chloroform	ND		20000	
2,2-Dichloropropane	ND		20000	
1,2-Dichloroethane	ND		20000	
1,1,1-Trichloroethane	ND		20000	
1,1-Dichloropropene	ND		20000	
Carbon tetrachloride	ND		20000	
Benzene	ND		20000	
Dibromomethane	ND		20000	
1,2-Dichloropropane	ND		20000	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X207**		Lab Sample ID:	**SF40329-07**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:22
Sample Type:		Sample Depth:	Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/16/14 14:53

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		20000	
Bromodichloromethane	ND		20000	
cis-1,3-Dichloropropene	ND		20000	
4-Methyl-2-pentanone (MIBK)	ND		20000	
trans-1,3-Dichloropropene	ND		20000	
1,1,2-Trichloroethane	ND		20000	
Toluene	**24000**		20000	
1,3-Dichloropropane	ND		20000	
2-Hexanone (MBK) *	ND		20000	
Dibromochloromethane	ND		20000	
1,2-Dibromoethane	ND		20000	
Tetrachloroethene	ND		20000	
1,1,1,2-Tetrachloroethane	ND		20000	
Chlorobenzene	ND		20000	
Ethylbenzene	ND		20000	
Bromoform	ND		20000	
Styrene	ND		20000	
1,1,2,2-Tetrachloroethane	ND		20000	
Xylenes, total	ND		20000	
1,2,3-Trichloropropane	ND		20000	
Isopropylbenzene	ND		20000	
Bromobenzene	ND		20000	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X207**		Lab Sample ID:	**SF40329-07**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:22
Sample Type:		Sample Depth:	Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/18/14 10:30
Units:	°F	Analyzed:	06/18/14 10:30

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:50

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**12200**		60.0	40000
Antimony	**254**		10.0	
Arsenic *	ND		10.0	
Barium	**221**		5.00	
Beryllium	ND		1.00	
Boron	**425**		10.0	
Cadmium	**7470**		3.00	
Calcium	**1340000**		300	100000
Chromium	**24200**		5.00	
Cobalt	**40.4**		10.0	
Copper	**373**		10.0	
Iron	**1650**		50.0	40000
Lead	**24.6**		5.00	
Magnesium	**81600**		300	100000
Manganese	**4840**		15.0	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X207**		Lab Sample ID:	**SF40329-07**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:22
Sample Type:		Sample Depth:	Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:50

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	**380**		5.00	
Potassium	**24700**		1400	100000
Selenium *	**20.1**		10.0	
Silver	ND		3.00	
Sodium	**130000**		300	
Strontium	**61300**		5.00	
Thallium	ND		10.0	
Vanadium	ND		5.00	
Zinc	**27900**		25.0	
Hardness	**3000000**		1980	

pH

Method:	150.1	Prepared:	07/07/14 12:15
Units:	PH	Analyzed:	07/07/14 13:52

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**4.1**	Q	0.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT		
Project/Facility Number:	0210600007	Date Received :	06/05/14
Funding Code:	LP41	Visit Number:	
Trip ID:		Temperature C:	11.0
Client Sample ID:	**X208**	Lab Sample ID:	**SF40329-08**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected: 06/05/14 13:34
Sample Type:		Sample Depth:	Total Depth: 0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/16/14 15:24

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		20000	
Vinyl chloride	ND		20000	
Bromomethane	ND		20000	
Chloroethane	ND		20000	
Trichlorofluoromethane	ND		20000	
Acetone	ND		100000	
1,1-Dichloroethene	ND		20000	
Methylene chloride	**520000**		50000	
Carbon disulfide	ND		20000	
trans-1,2-Dichloroethene	ND		20000	
Methyl tert-butyl ether	ND		20000	
1,1-Dichloroethane	ND		20000	
2-Butanone (MEK) *	ND		100000	
cis-1,2-Dichloroethene	ND		20000	
Bromochloromethane	ND		20000	
Chloroform	ND		20000	
2,2-Dichloropropane	ND		20000	
1,2-Dichloroethane	ND		20000	
1,1,1-Trichloroethane	ND		20000	
1,1-Dichloropropene	ND		20000	
Carbon tetrachloride	ND		20000	
Benzene	ND		20000	
Dibromomethane	ND		20000	
1,2-Dichloropropane	ND		20000	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0
Client Sample ID:	**X208**			Lab Sample ID:	**SF40329-08**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:34
Sample Type:		Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/16/14 15:24

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		20000	
Bromodichloromethane	ND		20000	
cis-1,3-Dichloropropene	ND		20000	
4-Methyl-2-pentanone (MIBK)	ND		20000	
trans-1,3-Dichloropropene	ND		20000	
1,1,2-Trichloroethane	ND		20000	
Toluene	**27000**		20000	
1,3-Dichloropropane	ND		20000	
2-Hexanone (MBK) *	ND		20000	
Dibromochloromethane	ND		20000	
1,2-Dibromoethane	ND		20000	
Tetrachloroethene	ND		20000	
1,1,1,2-Tetrachloroethane	ND		20000	
Chlorobenzene	ND		20000	
Ethylbenzene	ND		20000	
Bromoform	ND		20000	
Styrene	ND		20000	
1,1,2,2-Tetrachloroethane	ND		20000	
Xylenes, total	ND		20000	
1,2,3-Trichloropropane	ND		20000	
Isopropylbenzene	ND		20000	
Bromobenzene	ND		20000	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X208**		Lab Sample ID:	**SF40329-08**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:34
Sample Type:		Sample Depth:	Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/18/14 10:30
Units:	°F	Analyzed:	06/18/14 10:30

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:54

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**48200**		60.0	40000
Antimony	**245**		10.0	
Arsenic *	ND		10.0	
Barium	**1280**		5.00	
Beryllium	ND		1.00	
Boron	**306**		10.0	
Cadmium	**10800**		3.00	
Calcium	**455000**		300	100000
Chromium	**26200**		5.00	
Cobalt	**20.9**		10.0	
Copper	**357**		10.0	
Iron	**5080**		50.0	40000
Lead	**66.7**		5.00	
Magnesium	**43100**		300	100000
Manganese	**1660**		15.0	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X208**		Lab Sample ID:	**SF40329-08**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:34
Sample Type:		Sample Depth:	Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 12:54

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	**278**		5.00	
Potassium	**20700**		1400	100000
Selenium *	ND		10.0	
Silver	ND		3.00	
Sodium	**58400**		300	
Strontium	**16600**		5.00	
Thallium	ND		10.0	
Vanadium	ND		5.00	
Zinc	**4220**		25.0	
Hardness	**1310000**		1980	

pH

Method:	150.1	Prepared:	07/07/14 12:15
Units:	PH	Analyzed:	07/07/14 13:52

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**4.3**	Q	0.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X209**		Lab Sample ID:	**SF40329-09**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:42
Sample Type:		Sample Depth:	Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260		Prepared:	06/10/14 09:25
Units:	ug/L		Analyzed:	06/18/14 12:18

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		200	
Vinyl chloride	ND		200	
Bromomethane	ND		200	
Chloroethane	ND		200	
Trichlorofluoromethane	ND		200	
Acetone	ND		1000	
1,1-Dichloroethene	ND		200	
Methylene chloride	**15000**		500	
Carbon disulfide	ND		200	
trans-1,2-Dichloroethene	ND		200	
Methyl tert-butyl ether	ND		200	
1,1-Dichloroethane	ND		200	
2-Butanone (MEK) *	**20000**	L	1000	
cis-1,2-Dichloroethene	ND		200	
Bromochloromethane	ND		200	
Chloroform	ND		200	
2,2-Dichloropropane	ND		200	
1,2-Dichloroethane	ND		200	
1,1,1-Trichloroethane	ND		200	
1,1-Dichloropropene	ND		200	
Carbon tetrachloride	ND		200	
Benzene	ND		200	
Dibromomethane	ND		200	
1,2-Dichloropropane	ND		200	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X209**		Lab Sample ID:	**SF40329-09**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:42
Sample Type:		Sample Depth:	Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 12:18

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		200	
Bromodichloromethane	ND		200	
cis-1,3-Dichloropropene	ND		200	
4-Methyl-2-pentanone (MIBK)	ND		200	
trans-1,3-Dichloropropene	ND		200	
1,1,2-Trichloroethane	ND		200	
Toluene	**7200**		200	
1,3-Dichloropropane	ND		200	
2-Hexanone (MBK) *	ND		200	
Dibromochloromethane	ND		200	
1,2-Dibromoethane	ND		200	
Tetrachloroethene	ND		200	
1,1,1,2-Tetrachloroethane	ND		200	
Chlorobenzene	ND		200	
Ethylbenzene	ND		200	
Bromoform	ND		200	
Styrene	ND		200	
1,1,2,2-Tetrachloroethane	ND		200	
Xylenes, total	ND		200	
1,2,3-Trichloropropane	ND		200	
Isopropylbenzene	ND		200	
Bromobenzene	ND		200	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X209**		Lab Sample ID:	**SF40329-09**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:42
Sample Type:		Sample Depth:	Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/18/14 10:30
Units:	°F	Analyzed:	06/18/14 10:30

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 13:04

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**11300**		60.0	40000
Antimony	**473**		10.0	
Arsenic *	ND		10.0	
Barium	**299**		5.00	
Beryllium	ND		1.00	
Boron	**266**		10.0	
Cadmium	**7440**		3.00	
Calcium	**678000**		300	100000
Chromium	**51700**		5.00	
Cobalt	**25.6**		10.0	
Copper	**116**		10.0	
Iron	**5430**		50.0	40000
Lead	ND		5.00	
Magnesium	**47700**		300	100000
Manganese	**1240**		15.0	

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825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X209**		Lab Sample ID:	**SF40329-09**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:42
Sample Type:		Sample Depth:	Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 13:04

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	**198**		5.00	
Potassium	**30500**		1400	100000
Selenium *	ND		10.0	
Silver	ND		3.00	
Sodium	**58300**		300	
Strontium	**19600**		5.00	
Thallium	**10.7**		10.0	
Vanadium	ND		5.00	
Zinc	**766**		25.0	
Hardness	**1820000**		1980	

pH

Method:	150.1	Prepared:	07/07/14 12:15
Units:	PH	Analyzed:	07/07/14 13:52

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**4.8**	Q	0.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X210**		Lab Sample ID:	**SF40329-10**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:50
Sample Type:		Sample Depth:	Total Depth:	. 0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 13:53

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		20000	
Vinyl chloride	ND		20000	
Bromomethane	ND		20000	
Chloroethane	ND		20000	
Trichlorofluoromethane	ND		20000	
Acetone	ND		100000	
1,1-Dichloroethene	ND		20000	
Methylene chloride	**1200000**		50000	
Carbon disulfide	ND		20000	
trans-1,2-Dichloroethene	ND		20000	
Methyl tert-butyl ether	ND		20000	
1,1-Dichloroethane	ND		20000	
2-Butanone (MEK) *	ND		100000	
cis-1,2-Dichloroethene	ND		20000	
Bromochloromethane	ND		20000	
Chloroform	ND		20000	
2,2-Dichloropropane	ND		20000	
1,2-Dichloroethane	ND		20000	
1,1,1-Trichloroethane	ND		20000	
1,1-Dichloropropene	ND		20000	
Carbon tetrachloride	ND		20000	
Benzene	ND		20000	
Dibromomethane	ND		20000	
1,2-Dichloropropane	ND		20000	

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Reported:
08/04/14 08:50

Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41 .			Visit Number:	
Trip ID:				Temperature C:	11.0
Client Sample ID:	**X210**			Lab Sample ID:	**SF40329-10**
Matrix:	Water	Collected By:	PE/MW	Date/Time Collected:	06/05/14 13:50
Sample Type:	.	Sample Depth:		Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/L	Analyzed:	06/18/14 13:53

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		20000	
Bromodichloromethane	ND		20000	
cis-1,3-Dichloropropene	ND		20000	
4-Methyl-2-pentanone (MIBK)	ND		20000	
trans-1,3-Dichloropropene	ND		20000	
1,1,2-Trichloroethane	ND		20000	
Toluene	**56000**		20000	
1,3-Dichloropropane	ND		20000	
2-Hexanone (MBK) *	ND		20000	
Dibromochloromethane	ND		20000	
1,2-Dibromoethane	ND		20000	
Tetrachloroethene	ND		20000	
1,1,1,2-Tetrachloroethane	ND		20000	
Chlorobenzene	ND		20000	
Ethylbenzene	ND		20000	
Bromoform	ND		20000	
Styrene	ND		20000	
1,1,2,2-Tetrachloroethane	ND		20000	
Xylenes, total	ND		20000	
1,2,3-Trichloropropane	ND		20000	
Isopropylbenzene	ND		20000	
Bromobenzene	ND		20000	

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Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X210**		Lab Sample ID:	**SF40329-10**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:50
Sample Type:		Sample Depth:	Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/18/14 10:30
Units:	°F	Analyzed:	06/18/14 10:30

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	not amenable to flash point analysis		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 13:08

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**17000**		60.0	40000
Antimony	**161**		10.0	
Arsenic *	ND		10.0	
Barium	**416**		5.00	
Beryllium	ND		1.00	
Boron	**288**		10.0	
Cadmium	**1840**		3.00	
Calcium	**554000**		300	100000
Chromium	**15700**		5.00	
Cobalt	**32.2**		10.0	
Copper	**280**		10.0	
Iron	**12800**		50.0	40000
Lead	**148**		5.00	
Magnesium	**50900**		300	100000
Manganese	**1450**		15.0	

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Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X210**		Lab Sample ID:	**SF40329-10**
Matrix:	Water	Collected By: PE/MW	Date/Time Collected:	06/05/14 13:50
Sample Type:		Sample Depth:	Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/27/14 10:52
Units:	ug/L	Analyzed:	07/01/14 13:08

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	**173**		5.00	
Potassium	**65900**		1400	100000
Selenium *	ND		10.0	
Silver	ND		3.00	
Sodium	**74800**		300	
Strontium	**21000**		5.00	
Thallium	ND		10.0	
Vanadium	ND		5.00	
Zinc	**7830**		25.0	
Hardness	**1540000**		1980	

pH

Method:	150.1	Prepared:	08/01/14 15:08
Units:	PH	Analyzed:	08/01/14 15:10

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Laboratory pH	**4.2**	Q	0.0	

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Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X211**		Lab Sample ID:	**SF40329-11**
Matrix:	Organic Liquid	Collected By: PE/MW	Date/Time Collected:	06/05/14 14:20
Sample Type:		Sample Depth:	Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/kg	Analyzed:	06/17/14 18:08

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		93000	
Vinyl chloride	ND	J7	93000	
Bromomethane	ND		93000	
Chloroethane	ND		93000	
Trichlorofluoromethane	ND		93000	
Acetone	**1700000**		460000	
1,1-Dichloroethene	ND		93000	
Methylene chloride	ND		230000	
Carbon disulfide	ND		93000	
trans-1,2-Dichloroethene	ND		93000	
Methyl tert-butyl ether	ND		93000	
1,1-Dichloroethane	ND		93000	
2-Butanone (MEK) *	**65000000**	J1	4600000	
cis-1,2-Dichloroethene	ND		93000	
Bromochloromethane	ND		93000	
Chloroform	ND		93000	
2,2-Dichloropropane	ND		93000	
1,2-Dichloroethane	ND		93000	
1,1,1-Trichloroethane	ND		93000	
1,1-Dichloropropene	ND		93000	
Carbon tetrachloride	ND		93000	
Benzene	ND		93000	
Dibromomethane	ND		93000	
1,2-Dichloropropane	ND		93000	

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LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X211**		Lab Sample ID:	**SF40329-11**
Matrix:	Organic Liquid	Collected By: PE/MW	Date/Time Collected:	06/05/14 14:20
Sample Type:		Sample Depth:	Total Depth:	0

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/10/14 09:25
Units:	ug/kg	Analyzed:	06/17/14 18:08

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		93000	
Bromodichloromethane	ND		93000	
cis-1,3-Dichloropropene	ND		93000	
4-Methyl-2-pentanone (MIBK)	**11000000**	J1	930000	
trans-1,3-Dichloropropene	ND		93000	
1,1,2-Trichloroethane	ND		93000	
Toluene	**14000000**	J1	930000	
1,3-Dichloropropane	ND		93000	
2-Hexanone (MBK) *	ND		93000	
Dibromochloromethane	ND		93000	
1,2-Dibromoethane	ND		93000	
Tetrachloroethene	ND		93000	
1,1,1,2-Tetrachloroethane	ND		93000	
Chlorobenzene	ND		93000	
Ethylbenzene	**1900000**		93000	
Bromoform	ND		93000	
Styrene	ND		93000	
1,1,2,2-Tetrachloroethane	ND		93000	
Xylenes, total	**13000000**		93000	
1,2,3-Trichloropropane	ND		93000	
Isopropylbenzene	ND		93000	
Bromobenzene	ND		93000	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**X211**		Lab Sample ID:	**SF40329-11**
Matrix:	Organic Liquid	Collected By: PE/MW	Date/Time Collected:	06/05/14 14:20
Sample Type:		Sample Depth:	Total Depth:	0

Flashpoint by closed-cup tester

Method:	1010	Prepared:	06/17/14 10:30
Units:	°F	Analyzed:	06/17/14 13:00

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
FLASH POINT	<70		140	

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/30/14 07:41
Units:	ug/L	Analyzed:	07/11/14 11:41

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Aluminum	**21900**	J3	60.0	40000
Antimony	ND	J3	10.0	
Arsenic *	ND	J3	10.0	
Barium	**565**	J3	5.00	
Beryllium	ND	J3	1.00	
Boron	**15.3**	J3	10.0	
Cadmium	**156**	J3	3.00	
Calcium	ND	J3	300	100000
Chromium	**19100**	J3	5.00	
Cobalt	**595**	J3	10.0	
Copper	**137**	J3	10.0	
Iron	**353000**	J3	50.0	40000
Lead	ND	J3	5.00	
Magnesium	ND	J3	300	100000
Manganese	**315**	J3	15.0	

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825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**				
Project/Facility Number:	0210600007			Date Received :	06/05/14
Funding Code:	LP41			Visit Number:	
Trip ID:				Temperature C:	11.0
Client Sample ID:	**X211**			Lab Sample ID:	**SF40329-11**
Matrix:	Organic Liquid	Collected By:	PE/MW	Date/Time Collected:	06/05/14 14:20
Sample Type:		Sample Depth:		Total Depth:	0

Metals by EPA 6000/7000 Series Methods

Method:	6010	Prepared:	06/30/14 07:41
Units:	ug/L	Analyzed:	07/11/14 11:41

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Nickel	ND	J3	5.00	
Potassium	**7970**	J3	1400	100000
Selenium *	**2380**	J3	10.0	
Silver	ND	J3	3.00	
Sodium	**3090**	J3	300	
Strontium	**2400**	J3	5.00	
Thallium	**55.1**	J3	10.0	
Vanadium	ND	J3	5.00	
Zinc	**56000**	J3	25.0	
Hardness	ND		1980	

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Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**TRIP BLANK**		Lab Sample ID:	**SF40329-12**
Matrix:	Water	Collected By:	Date/Time Collected:	06/05/14 0:00
Sample Type:		Sample Depth:	Total Depth:	

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/09/14 10:00
Units:	ug/L	Analyzed:	06/09/14 16:22

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Chloromethane	ND		2.0	
Vinyl chloride	ND		2.0	
Bromomethane	ND		2.0	
Chloroethane	ND		2.0	
Trichlorofluoromethane	ND		2.0	
Acetone	ND		10	
1,1-Dichloroethene	ND		2.0	
Methylene chloride	ND		5.0	
Carbon disulfide	ND		2.0	
trans-1,2-Dichloroethene	ND		2.0	
Methyl tert-butyl ether	ND		2.0	
1,1-Dichloroethane	ND		2.0	
2-Butanone (MEK) *	ND		10	
cis-1,2-Dichloroethene	ND		2.0	
Bromochloromethane	ND		2.0	
Chloroform	ND		2.0	
2,2-Dichloropropane	ND		2.0	
1,2-Dichloroethane	ND		2.0	
1,1,1-Trichloroethane	ND		2.0	
1,1-Dichloropropene	ND		2.0	
Carbon tetrachloride	ND		2.0	
Benzene	ND		2.0	
Dibromomethane	ND		2.0	
1,2-Dichloropropane	ND		2.0	

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LABORATORY RESULTS

Name:	BRANDIS AIRCRAFT			
Project/Facility Number:	0210600007		Date Received :	06/05/14
Funding Code:	LP41		Visit Number:	
Trip ID:			Temperature C:	11.0
Client Sample ID:	**TRIP BLANK**		Lab Sample ID:	**SF40329-12**
Matrix:	Water	Collected By:	Date/Time Collected:	06/05/14 0:00
Sample Type:		Sample Depth:	Total Depth:	

Volatiles Organic Compounds by Purge and Trap GC/MS

Method:	8260	Prepared:	06/09/14 10:00
Units:	ug/L	Analyzed:	06/09/14 16:22

Analyte	Result	Qualifier	Reporting Limit	Regulatory Level
Trichloroethene	ND		2.0	
Bromodichloromethane	ND		2.0	
cis-1,3-Dichloropropene	ND		2.0	
4-Methyl-2-pentanone (MIBK)	ND		2.0	
trans-1,3-Dichloropropene	ND		2.0	
1,1,2-Trichloroethane	ND		2.0	
Toluene	ND		2.0	
1,3-Dichloropropane	ND		2.0	
2-Hexanone (MBK) *	ND		2.0	
Dibromochloromethane	ND		2.0	
1,2-Dibromoethane	ND		2.0	
Tetrachloroethene	ND		2.0	
1,1,1,2-Tetrachloroethane	ND		2.0	
Chlorobenzene	ND		2.0	
Ethylbenzene	ND		2.0	
Bromoform	ND		2.0	
Styrene	ND		2.0	
1,1,2,2-Tetrachloroethane	ND		2.0	
Xylenes, total	ND		2.0	
1,2,3-Trichloropropane	ND		2.0	
Isopropylbenzene	ND		2.0	
Bromobenzene	ND		2.0	

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825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**		
Project/Facility Number:	0210600007	Date Received :	06/05/14
Funding Code:	LP41	Visit Number:	
Trip ID:		Temperature C:	11.0

Notes and Definitions

Q	Maximum holding time exceeded.
L	Actual value not known, but known to be greater than value shown. Value shown is the highest acceptable level for quantitation. (For bacteria, result calculated as if the smallest filtration volume had a count of 200).
J7	Blank spike failed low - possible low bias or false non-detect result.
J3	The reported value failed to meet the established quality control criteria for either precision or accuracy possibly due to matrix effects.
J1	Surrogate compound recovery limits have not been met.
B2	The sample matrix caused possible effects on measurement. The result may be biased high.
B1	The sample matrix caused possible effects on measurement. The result may be biased low.
ND	Analyte NOT DETECTED at or above the reporting limit
*	Non-NELAP accredited

SF40329-03 & SF40329-06: These two samples were a solid material, however, due to the composition of the samples, the laboratory could not perform the dry weight test. (For safety issues, the samples were not placed in an oven overnight.) Results will be reported on a wet weight basis.

Method 8260: Tentatively Identified Compounds (TICs) were detected in the volatile analysis of sample SF40329-11. Please contact the laboratory if additional information about the TICs is needed.

Method 8260: Due to the high concentration of analytes, matrix spikes and matrix spike duplicates were not analyzed for this method. Therefore, NELAC and method requirements were not all met.

Method 8260: Reporting limits were increased for samples due to the amount of diluting that was required to bring the high-level analytes into the detector's analytical range.

Metals: SF40329-01 Client Matrix Assessment- sample failed post spike test for Arsenic and Thallium, indicating probable matrix intereference.

Illinois Environmental Protection Agency Laboratory

825 N. Rutledge Springfield, Illinois 62702 217.782.9780

LABORATORY RESULTS

Name:	**BRANDIS AIRCRAFT**		
Project/Facility Number:	0210600007	Date Received :	06/05/14
Funding Code:	LP41	Visit Number:	
Trip ID:		Temperature C:	11.0

Metals: SF40329-03 Client Matrix Assessment- sample failed post spike test for Arsenic, Barium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Nickel, Sodium, Strontium, Vanadium, Antimony, and Thallium, indicating probable matrix intereference. Sample failed method dilution test for Calcium, Cadmium, Iron, Lead, Magnesium, and Manganese indicating probable matrix intereference.

Metals: SF40329-11 Client Matrix Assessment- sample failed post spike test for Arsenic, Chromium, Iron, and Zinc, indicating probable matrix intereference.

SF40329-11: Due to the oily nature of this sample, the pH test could not be performed.

Report Authorized by:

Matthew C. Neely
Organic Analysis Unit Supervisor

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Reported:
08/04/14 08:50

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-2829
PAT QUINN, GOVERNOR LISA BONNETT, DIRECTOR

September 19, 2014

CERTIFIED MAIL #7012 0470 0001 3001 5140
RETURN RECEIPT REQUESTED

Corporation Service Company
Registered Agent for
Brandis Aircraft, LLC
2711 Centerville Road, Suite 400
Wilmington, Delaware 19808

Re: **Violation Notice, L-2014-01131**
LPC #0210600007 - Christian County
Taylorville/The Paint Shop (aka Brandis Aircraft)
ILD982621690
Compliance File

Violation Notice, L-2014-01131
LPC #0210605081 - Christian County
Taylorville/Evergreen Aviation
Compliance File

To whom it may concern:

This constitutes a Violation Notice pursuant to Section 31(a)(1) of the Illinois Environmental Protection Act, 415 ILCS 5/31(a)(1), and is based on inspections conducted on May 16, and 21, and June 5, 2014 and a record review (see enclosed report) of the above referenced facilities by representatives of the Illinois Environmental Protection Agency ("Illinois EPA").

The Illinois EPA hereby provides notice of alleged violations of environmental laws, regulations, or permits as set forth in the attachment to this notice. The attachment includes an explanation of the activities that the Illinois EPA believes may resolve the specified alleged violations, including an estimate of a reasonable time period to complete the necessary activities. Due to the nature and seriousness of the alleged violations, please be advised that resolution of the violations may also require the involvement of a prosecutorial authority for purposes that may include, among others, the imposition of statutory penalties.

A written response, which may include a request for a meeting with representatives of the Illinois EPA, must be submitted via certified mail to the Illinois EPA within 45 days of receipt of this notice. If a meeting is requested, it shall be held within 60 days of receipt of this notice. The response must include information in rebuttal, explanation, or justification of each alleged violation and a statement indicating whether or not you wish to enter into a Compliance Commitment Agreement ("CCA") pursuant to Section 31(a) of the Act. If you wish to enter into a CCA, the written response must also include proposed terms for the CCA that includes dates for achieving each commitment and may include a statement that compliance has been achieved for some or all of the alleged violations. The proposed terms of the CCA should contain sufficient detail and must include steps to be taken to achieve compliance and the necessary dates by which compliance will be achieved.

The Illinois EPA will review the proposed terms for a CCA provided by you and, within 30 days of receipt, will respond with either a proposed CCA or a notice that no CCA will be issued by the Illinois

EPA. If the Illinois EPA sends a proposed CCA, you must respond in writing either by agreeing to and signing the proposed CCA or by notifying the Illinois EPA that you reject the terms of the proposed CCA.

If a timely written response to this Violation Notice is not provided, it shall be considered a waiver of the opportunity to respond and meet, and the Illinois EPA may proceed with referral to a prosecutorial authority.

Written communications should be directed to:

Illinois Environmental Protection Agency
Bureau of Land Field Operations Section
Springfield Field Office Staff, MC #10
1021 North Grand Avenue East, P. O. Box 19276
Springfield, Illinois 62794-9276
Attention: Steve Townsend

Please include the Violation Notice Number **L-2014-01131** and the Site Identification Numbers **LPC #0210600007** and **LPC #0210605081** on all written communications.

The complete requirements of the Illinois Environmental Protection Act and any Illinois Pollution Control Board regulations cited herein or in the inspection report can be viewed at:

http://www.ipcb.state.il.us/SLR/TheEnvironmentalProtectionAct.asp

and

http://www.ipcb.state.il.us/SLR/IPCBandIEPAEnvironmentalRegulations-Title35.asp

If you have questions regarding this matter, or want the inspection photos e-mailed to you, please contact Steve Townsend at (217) 557-8761.

Sincerely,

David C. Jansen

David C. Jansen
Springfield Region Manager
Field Operations Section
Division of Land Pollution Control

DCJ/SCT/cp(N:\REG\Springfield\SPF Region BOL_SHARE\SCT\TEMP FOR DJ\Brandis\Brandis Docs\DE Agent Brandis VN.docx)

Enclosure

cc: DLPC/Division File
DLPC/FOS - Springfield Region

ec: BOL, Karen Hoffman

ATTACHMENT A

1. Pursuant to 35 Ill. Adm. Code Section 703.121(a), no person shall conduct any hazardous waste storage, hazardous waste treatment, or hazardous waste disposal operation:

   1. Without a RCRA permit for the HWM (hazardous waste management) facility; or

   2. In violation of any condition imposed by a RCRA permit.

   A violation of 35 Ill. Adm. Code 703.121(a) is alleged for the following reasons: **Hazardous waste was stored and treated without a RCRA permit in the north hangar. The exemption from RCRA storage permit requirements does not apply because the requirements of 722.134(a) were not fulfilled.**

2. Pursuant to 35 Ill. Adm. Code Section 703.121(b), owners and operators of HWM units shall have permits during the active life (including the closure period) of the unit...

   A violation of 35 Ill. Adm. Code 703.121(b) is alleged for the following reason: **The owner or operator did not have a RCRA permit to treat or store hazardous waste.**

3. Pursuant to 35 Ill. Adm. Code Section 703.150(a)(2), the owner or operator of an existing HWM facility...that render the facility subject to the requirement to have a RCRA permit must submit Part A of the permit application to the Agency no later than...thirty days after the date the owner or operator first becomes subject to the standards in 35 Ill. Adm. Code 725 or 726.

   A violation of 35 Ill. Adm. Code 703.150(a)(2) is alleged for the following reason: **No Part A permit application was submitted for hazardous waste storage and treatment.**

4. Pursuant to 35 Ill. Adm. Code Section 722.134(a), except as provided in subsection (d), (e), (f), (g), (h), or (i) of this Section, a generator is exempt from all the requirements in 35 Ill. Adm. Code 725.Subparts G and H, except for 35 Ill. Adm. Code 725.211 and 725.214, and may accumulate hazardous waste on-site for 90 days or less without a permit or without having interim status, provided that the following conditions are fulfilled:

   1. The waste is placed in or on one of the following:

      A. in containers and the generator complies with 35 Ill. Adm. Code 725.Subparts I, AA, BB, and CC;

      B. In tanks, and the generator complies with 35 Ill. Adm. Code 725.Subparts J, AA, BB, and CC, except 35 Ill. Adm. Code 725.297(c) and 725.300;

      C. On drip pads, and the generator complies with 35 Ill. Adm. Code 725.Subpart W and maintains the following records at the facility...;

      D. in containment buildings and the generator complies with 35 Ill. Adm. Code 725.Subpart DD...

   2. The date upon which each period of accumulation begins is clearly marked and visible for inspection on each container;

3. While being accumulated on-site, each container and tank is labeled or marked clearly with the words "Hazardous Waste"; and

4. The generator complies with the requirements for owners or operators in 35 Ill. Adm. Code 725.Subparts C and D and with 35 Ill. Adm. Code 725.116 and 728.107(a)(5).

The generator did not meet the requirements for a permit exemption under 722.134(a) for a failure to fulfill the following conditions:

- **As required by 35 Ill. Adm. Code Section 725.271, hazardous wastes accumulated in bags had leaked such that the floor had been damaged by the wastes and the wastes were not transferred to a suitable container as of the May 16, 2014 inspection.**

- **As required by 35 Ill. Adm. Code Section 725.272, hazardous wastes were accumulated in bags which were not compatible with or able to contain such wastes.**

- **As required by 35 Ill. Adm. Code Section 725.273(b), hazardous wastes were accumulated in bags such that they were not completely closed, leaked, and damaged the floor below.**

- **As required by 35 Ill. Adm. Code Section 725.274, hazardous wastes accumulated in bags had leaked, such that the floor had been damaged by the wastes. No evidence that the accumulation area was ever inspected was found during the inspection. The condition of the bags and the damage caused by previous leaks were not noted in any inspection record.**

- **As required by 35 Ill. Adm. Code Section 722.134(a)(2), hazardous waste was placed in multiple 55 gallon and other containers, and the generator had not placed the date upon which each period of accumulation began so that it was clearly marked and visible for inspection.**

- **As required by 35 Ill. Adm. Code Section 722.134(a)(3), hazardous waste was placed in containers, and the containers had not been labeled or marked clearly with the words "Hazardous Waste."**

- **As required by 35 Ill. Adm. Code Section 722.134(a)(4), the generator has not complied with the requirements for treatment, storage, and disposal facility owners or operators in 35 Ill. Adm. Code 725 Subparts C and D and with 35 Ill. Adm. Code 725.116.**

5. Pursuant to 35 Ill. Adm. Code Section 725.137 of Subpart C, the owner or operator must attempt to make arrangements (as specified in 725.137(a)(1),(2),(3),(and (4)) as appropriate for the type of waste handled at his facility and the potential need for the services:

   A violation of 35 Ill. Adm. Code 725.137 is alleged for the following reason: **Arrangements were not made to familiarize police, fire departments, emergency response teams, and hospitals with the information required by 725.137(a)(1),(2),(3),(and (4).**

6. Pursuant to 35 Ill. Adm. Code Section 725.151(a) of Subpart D, the owner or operator must have a contingency plan for his facility. The contingency plan must be designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water.

A violation of 35 Ill. Adm. Code 725.151(a) is alleged for the following reason: **The prepared contingency plan did not address the treatment of hazardous wastes and releases to the air from the wastewater treatment process.**

7. Pursuant to 35 Ill. Adm. Code Section 722.111, a person that generates a solid waste, as defined in 35 Ill. Adm. Code 721.102, must determine if that waste is a hazardous waste using the following method:

   a) The person should first determine if the waste is excluded from regulation under 35 Ill. Adm. Code 721.104.

   b) The person should then determine if the waste is listed as a hazardous waste in Subpart D of 35 Ill. Adm. Code 721.

   BOARD NOTE: Even if a waste is listed as a hazardous waste, the generator still has an opportunity under 35 Ill. Adm. Code 720.122 to demonstrate that the waste from the generator's particular facility or operation is not a hazardous waste.

   c) For purposes of compliance with 35 Ill. Adm. Code 728, or if the waste is not listed as a hazardous waste in Subpart D of 35 Ill. Adm. Code 721, the generator must then determine whether the waste is identified in Subpart C of 35 Ill. Adm. Code 721 by either of the following methods:

      1) Testing the waste according to the methods set forth in Subpart C of 35 Ill. Adm. Code 721, or according to an equivalent method approved by the Board under 35 Ill. Adm. Code 720.121; or

      2) Applying knowledge of the hazard characteristic of the waste in light of the materials or processes used.

   d) If the generator determines that the waste is hazardous, the generator must refer to 35 Ill. Adm. Code 724 through 728, and 733 for possible exclusions or restrictions pertaining to the management of the specific waste.

   A violation of 35 Ill. Adm. Code 722.111 is alleged for the following reason: **Incorrect or no hazardous waste determinations were made for spent stripper, stripper rinse water, contaminated plastic sheeting, paint waste solids, paint booth filters, other paint related waste, solvent contaminated rags, and spent fluorescent bulbs. Additionally, no hazardous waste determinations were made on the wastes in the drums and carboys delivered to the carwash in Taylorville.**

8. Pursuant to Section 808.121(a), each person who generates waste shall determine whether the waste is a special waste. BOARD NOTE: 35 Ill. Adm. Code 722 requires the person to also determine if the waste is a hazardous waste.

   A violation of 35 Ill. Adm. Code 808.121(a) is alleged for the following reason: **Incorrect or no special waste determinations were made for spent stripper, stripper rinse water, contaminated plastic sheeting, paint waste solids, paint booth filters, other paint related waste, solvent contaminated rags, and spent fluorescent bulbs. Additionally, no special waste determinations were made on the wastes in the drums and carboys delivered to the carwash in Taylorville.**

9. Pursuant to 35 Ill. Adm. Code 725.113(a), waste analysis:

1) Before an owner or operator treats, stores, or disposes of any hazardous wastes, or non-hazardous wastes if applicable under Section 725.213(d), the owner or operator must obtain a detailed chemical and physical analysis of a representative sample of the wastes. At a minimum, the analysis must contain all the information that must be known to treat, store, or dispose of the waste in accordance with this Part and 35 Ill. Adm. Code 728.

2) The analysis may include data developed under 35 Ill. Adm. Code 721 and existing published or documented data on the hazardous waste or on waste generated from similar processes.

BOARD NOTE: For example, the facility's record of analyses performed on the waste before the effective date of these regulations or studies conducted on hazardous waste generated from processes similar to that which generated the waste to be managed at the facility may be included in the data base required to comply with subsection (a)(1) of this Section, except as otherwise specified in 35 Ill. Adm. Code 728.107(b) and (c). The owner or operator of an off-site facility may arrange for the generator of the hazardous waste to supply part or all of the information required by subsection (a)(1) of this Section. If the generator does not supply the information and the owner or operator chooses to accept a hazardous waste, the owner or operator is responsible for obtaining the information required to comply with this Section.

3) The analysis must be repeated as necessary to ensure that it is accurate and up to date. At a minimum, the analysis must be repeated as follows:

A) When the owner or operator is notified or has reason to believe that the process or operation generating the hazardous waste, or non-hazardous waste if applicable under Section 725.213(d), has changed; and

B) For off-site facilities, when the results of the inspection required in subsection (a)(4) of this Section indicate that the hazardous waste received at the facility does not match the waste designated on the accompanying manifest or shipping paper.

4) The owner or operator of an off-site facility must inspect and, if necessary, analyze each hazardous waste movement received at the facility to determine whether it matches the identity of the waste specified on the accompanying manifest or shipping paper.

A violation of 35 Ill. Adm. Code 725.113(a) is alleged for the following reason: **Hazardous wastes were stored and treated and the owner or operator of the facility did not have a detailed chemical and physical analysis of representative samples of the hazardous wastes at the time of initial inspection.**

10. Pursuant to 35 Ill. Adm. Code 725.113(b), the owner or operator must develop and follow a written waste analysis plan that describes the procedures that the owner or operator will carry out to comply with subsection (a) of this Section. The owner or operator must keep this plan at the facility. At a minimum, the plan must specify the following:

1) The parameters for which each hazardous waste, or non-hazardous waste if applicable under Section 725.213(d), will be analyzed and the rationale for the selection of these parameters (i.e.,

how analysis for these parameters will provide sufficient information on the waste's properties to comply with subsection (a) of this Section.

2) The test methods that will be used to test for these parameters.

3) The sampling method that will be used to obtain a representative sample of the waste to be analyzed. A representative sample may be obtained using either of the following methods:

   A) One of the sampling methods described in Appendix A of 35 Ill. Adm. Code 721, or

   B) An equivalent sampling method.

BOARD NOTE: See 35 Ill. Adm. Code 720.120(c) for related discussion.

4) The frequency with which the initial analysis of the waste will be reviewed or repeated to ensure that the analysis is accurate and up-to-date.

5) For off-site facilities, the waste analyses that hazardous waste generators have agreed to supply.

6) Where applicable, the methods that will be used to meet the additional waste analysis requirements for specific waste management methods, as specified in Sections 725.300, 725.325, 725.352, 725.373, 725.414, 725.441, 725.475, 725.502, 725.934(d), 725.963(d), and 725.984 and 35 Ill. Adm. Code 728.107.

7) For surface impoundments exempted from land disposal restrictions under 35 Ill. Adm. Code 728.104(a), the procedures and schedules for the following:

   A) The sampling of impoundment contents;

   B) The analysis of test data; and

   C) The annual removal of residues that are not delisted under 35 Ill. Adm. Code 720.122 or that exhibit a characteristic of hazardous waste and either of the following is true:

      i) The waste residues do not meet the applicable treatment standards of Subpart D of 35 Ill. Adm. Code 728, or

      ii) Where no treatment standards have been established, the waste residues are prohibited from land disposal under 35 Ill. Adm. Code 728.132 or 728.139.

8) For an owner or operator seeking an exemption to the air emission standards of Subpart CC of 35 Ill. Adm. Code 724 in accordance with Section 725.983:

   A) If direct measurement is used for the waste determination, the procedures and schedules for waste sampling and analysis, and the analysis of test data to verify the exemption.

   B) If knowledge of the waste is used for the waste determination, any information prepared by the facility owner or operator, or by the generator of the waste if the waste is received from off-site, that is used as the basis for knowledge of the waste.

A violation of 35 Ill. Adm. Code 725.113(b) is alleged for the following reason: **The owner or operator did not have a written waste analysis plan as required.**

11. Pursuant to 35 Ill. Adm. Code 725.115(a), the owner or operator must inspect the facility for malfunctions and deterioration, operator errors and discharges that may be causing - or which may lead to - the conditions listed below. The owner or operator must conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment.

    1) Release of hazardous waste constituents to the environment, or

    2) A threat to human health.

    A violation of 35 Ill. Adm. Code 725.115(a) is alleged for the following reason: **Inspections were not conducted as required.**

12. Pursuant to 35 Ill. Adm. Code 725.115(b),

    1) The owner or operator must develop and follow a written schedule for inspecting all monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment (such as dikes and sump pumps) that are important to preventing, detecting, or responding to environmental or human health hazards.

    2) The owner or operator must keep this schedule at the facility.

    3) The schedule must identify the types of problems (e.g., malfunctions or deterioration) that are to be looked for during the inspection (e.g., inoperative sump pump, leaking fitting, eroding dike, etc.).

    4) The frequency of inspection may vary for the items on the schedule. However, the frequency should be based on the rate of deterioration of the equipment and the probability of an environmental or human health incident if the deterioration, malfunction, or operator error goes undetected between inspections. Areas subject to spills, such as loading and unloading areas, must be inspected daily when in use. At a minimum, the inspection schedule must include the items and frequencies called for in Sections 725.274, 725.293, 725.295, 725.326, 725.360, 725.378, 725.404, 725.447, 725.477, 725.503, 725.933, 725.952, 725.953, 725.958, and 725.984 through 725.990, where applicable.

    A violation of 35 Ill. Adm. Code Section 725.115(b) is alleged for the following reason: **The owner or operator did not have a written inspection schedule for the hazardous waste storage and treatment operations.**

13. Pursuant to 35 Ill. Adm. Code 725.116(a),

    1) Facility personnel must successfully complete a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures the facility's compliance with the requirements of this part. The owner or operator must ensure that this program includes all the elements described in the document required under subsection (d)(3) of this Section.

    2) This program must be directed by a person trained in hazardous waste management procedures, and must include instruction that teaches facility personnel hazardous waste management procedures (including contingency plan implementation) relevant to the positions in which they are employed.

3) At a minimum, the training program must be designed to ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment and emergency systems, including the following where applicable:

   A) Procedures for using, inspecting, repairing and replacing facility emergency and monitoring equipment;

   B) Key parameters for automatic waste feed cut-off systems;

   C) Communications or alarm systems;

   D) Response to fires or explosions;

   E) Response to groundwater contamination incidents; and

   F) Shutdown of operations.

4) For facility employees that receive emergency response training pursuant to the federal Occupational Safety and Health Administration (OSHA) regulations at 29 CFR 1910.120(p)(8) and 1910.120(q), the facility is not required to provide separate emergency response training pursuant to this section, provided that the overall facility OSHA emergency response training meets all the requirements of this Section.

A violation of 35 Ill. Adm. Code 725.116(a) is alleged for the following reason: **Facility personnel were not trained in a way to ensure their facility's compliance with Part 725.**

14. Pursuant to 35 Ill. Adm. Code 725.173(a), the owner or operator must keep a written operating record at the facility. The written operating record must contains the information required by 725.173(b), including, but not limited to a description of the hazardous at the site, the methods and dates of treatment, storage, or disposal, the location of each hazardous waste, records and results of waste analysis, a summary reports and details of any incident that requires implementing the contingency plan, the results of inspections, and a copy of closure cost estimates.

    A violation of 35 Ill. Adm. Code 725.173 is alleged for the following reason: **The owner or operator of the facility did not maintain an operating record with all the required information.**

15. Pursuant to 35 Ill. Adm. Code 725.212(a), within six months after the effective date of the rule that first subjects a facility to provisions of this Section, the owner or operator of a hazardous waste management facility must have a written closure plan. Until final closure is completed and certified in accordance with Section 725.215, a copy of the most current plan must be furnished to the Agency upon request including request by mail. In addition, for facilities without approved plans, it must also be provided during site inspections on the day of inspection to any officer, employee, or representative of the Agency.

    A violation of 35 Ill. Adm. Code 725.212(a) is alleged for the following reason: **The owner or operator of the facility had not developed a closure plan for the treatment and storage of hazardous wastes.**

16. Pursuant to 35 Ill. Adm. Code 725.242(a), the owner or operator must have a detailed written estimate, in current dollars, of the cost of closing the facility in accordance with the requirements in

Sections 725.211 through 725.215 and applicable closure requirements of Sections 725.297, 725.328, 725.358, 725.380, 725.410, 725.451, 725.481, 725.504, and 725.1102.

1) The estimate must equal the cost of final closure at the point in the facility's active life when the extent and manner of its operation would make closure the most expensive, as indicated by its closure plan (see Section 725.212(b)); and

2) The closure cost estimate must be based on the costs to the owner or operator of hiring a third party to close the facility. A third party is a party that is neither a parent nor a subsidiary of the owner or operator. (See definition of "parent corporation" in Section 725.241(d).) The owner or operator may use costs for on-site disposal if the owner or operator demonstrates that on-site disposal capacity will exist at all times over the life of the facility.

3) The closure cost estimate must not incorporate any salvage value that may be realized by the sale of hazardous wastes, or non-hazardous wastes if permitted by the Agency pursuant to Section 725.213(d), facility structures or equipment, land or other facility assets at the time of partial or final closure.

4) The owner or operator must not incorporate a zero cost for hazardous waste, or non-hazardous waste if permitted by the Agency pursuant to Section 725.213(d), that may have economic value.

A violation of 35 Ill. Adm. Code 725.242(a) is alleged for the following reason: **The owner or operator of the facility has not prepared a detailed written estimate, in current dollars, of the cost of closing the treatment and storage units.**

17. Pursuant to 35 Ill. Adm. Code 739.122(c) containers and aboveground tanks used to store used oil at generator facilities must be labeled or marked clearly with the words "Used Oil."

A violation of 35 Ill. Adm. Code Section 739.122(c) is alleged for the following reason: **Drums and smaller containers of used oil were observed without the required labeling.**

18. Pursuant to 35 Ill. Adm. Code 809.201, no person may haul or otherwise transport any special waste generated within Illinois or any special waste to be disposed of, stored or treated within Illinois without a current, valid special waste hauling permit issued by the Agency in accordance with the requirements of this Subpart unless the transporter is exempt from the special waste hauling permit requirements under this Subpart. These regulations do not apply to on-site transportation of special waste by generators or by owners or operators of permitted special waste management facilities.

A violation of 35 Ill. Adm. Code 809.201 is alleged for the following reason: **Special wastes in drums and carboys were transported to a carwash by a transporter not having a current valid special waste hauling permit.**

19. Pursuant to 35 Ill. Adm. Code 809.301, no person may deliver any special waste generated within Illinois or for disposal, storage or treatment within Illinois unless that person concurrently delivers a manifest completed in accordance with Subpart E of this Part to a special waste transporter who holds a current special waste hauling permit issued by the Agency under Subpart B or C of this Part.

A violation of 35 Ill. Adm. Code Section 809.301 is alleged for the following reason: **Special wastes in drums and carboys were delivered to an unpermitted special waste hauler without Illinois EPA manifests accompanying the wastes.**

20. Pursuant to 35 Ill. Adm. Code 809.302(b), no person may deliver special waste in Illinois for disposal, storage or treatment unless the person who accepts the special waste has a current, valid operating permit issued by the Agency and the necessary supplemental permits required by 35 Ill. Adm. Code 807, as well as all other applicable permits as required by the Act and Board regulations.

    A violation of 35 Ill. Adm. Code 809.302(b) is alleged for the following reason: **Special wastes in drums and carboys were transported to a carwash that did not have the necessary permits to accept the wastes.**

21. Pursuant to 21(f)(1) of the Illinois Environmental Protection Act, no person shall conduct any hazardous waste-storage, hazardous waste-treatment, or hazardous waste-disposal operation without a RCRA permit for the site issued by the Illinois Environmental Protection Agency.

    A violation of the Section 21(f)(1) of the Illinois Environmental Protection Act is alleged for the following reasons: **Hazardous waste was stored and treated without a RCRA permit issued by the Illinois EPA.**

22. Pursuant to 21(f)(2) of the Act, no person shall conduct any hazardous waste-storage, hazardous waste-treatment, or hazardous waste-disposal operation in violation of any regulations or standards adopted by the Illinois Pollution Control Board under the Act.

    A violation of the Section 21(f)(2) of the Act is alleged for the following reasons: **Hazardous waste was stored and treated in violation of regulations adopted by the Board under this Act.**

23. Pursuant to 21(i) of the Act, no person shall conduct any process or engage in any act which produces hazardous waste in violation of any regulations or standards adopted by the Board under subsections (a) and (c) of Section 22.4 of this Act.

    A violation of the Section 21(i) of the Act is alleged for the following reasons: **The owner or operator conducted processes and engaged in acts which produced hazardous waste in violation of regulations or standards adopted by the Board under subsections (a) and (c) of Section 22.4 of this Act.**

24. Pursuant to 21(j) of the Act, no person shall conduct any special waste transportation operation in violation of any regulations, standards or permit requirements adopted by the Board under this Act.

    A violation of the Section 21(j) of the Act is alleged for the following reasons: **Special wastes were transported in violation of Board regulations.**

SUGGESTED RESOLUTIONS

1. Immediately cease the unpermitted treatment and storage of hazardous waste on-site, and remove, via an Illinois EPA permitted special waste hauler carrying properly completed Illinois EPA hazardous waste manifests, all current accumulations of hazardous waste for proper treatment or disposal at a properly permitted hazardous waste facility.

2. Immediately cease the transportation of special waste from your facility without the use of an Illinois EPA permitted special waste hauler carrying a properly completed Illinois EPA manifest to a properly permitted facility.

3. Immediately mark on all hazardous waste containers the date upon which each period of accumulation begins.

4. Immediately mark "Hazardous Waste" on all hazardous waste containers, and store all such containers in compliance with the requirements of Part 725, Subpart I.

5. Immediately label all used oil containers with the words "Used Oil."

6. By October 31, 2014, provide to the Illinois EPA documentation of compliance with the requirements of Section 725.137(a)(1),(2),(3) and (4).

7. By October 31, 2014, provide to the Illinois EPA a copy of a contingency plan that is designed to minimize hazards to human health or the environmental from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air or soil, pursuant to Section 725.151(a). The content of the contingency plan must meet all the applicable requirements of Section 725.152(a) through (f).

8. By October 31, 2014, provide to the Illinois EPA your hazardous waste determinations for the spent stripper, stripper rinse water, contaminated plastic sheeting, paint waste solids, paint booth filters, other paint related waste, solvent contaminated rags, spent fluorescent bulbs, and the wastes that were hauled in drums and carboys to the car wash in Taylorville.

9. By October 31, 2014, provide to the Illinois EPA your special waste determinations for the spent stripper, stripper rinse water, contaminated plastic sheeting, paint waste solids, paint booth filters, other paint related waste, solvent contaminated rags, spent fluorescent bulbs, and the wastes that were hauled in drums and carboys to the car wash in Taylorville.

10. By October 31, 2014, provide to the Illinois EPA a copy of a written operating record that meets all the applicable requirements of Section 725.173(b)(1) through (19).

11. By October 31, 2014, provide to the Illinois EPA detailed chemical and physical analyses of representative samples of all your hazardous wastes, and keep copies on-site, as required by Section 725.113.

12. By October 31, 2014, provide to the Illinois EPA a written waste analysis plan that describes the procedures that the owner or operator will carry out to comply with Section 725.113(a) and keep a copy of such a plan on-site.

13. By October 31, 2014, provide to the Illinois EPA copies of written inspection records documenting the inspections required by Section 725.115.

14. By October 31, 2014, provide to the Illinois EPA a copy of a written inspection schedule that meets all the requirements of Section 725.115(b).

15. By October 31, 2014, provide to the Illinois EPA copies of a personnel training plan and training records that meet all the applicable requirements of Section 725.116.

16. By October 31, 2014, provide to the Illinois EPA a detailed accounting of the amounts, types, and disposition of all hazardous wastes generated at your facility from January 4, 2010, the date of your last manifested shipment of hazardous wastes from your facility, to the present. Legible copies of any manifests used during this time period must also be submitted to the Illinois EPA by October 31, 2014.

17. By November 20, 2014, submit to the Illinois EPA's Bureau of Land Permits Section for review and approval an approvable application for a RCRA closure plan for the hazardous waste treatment and waste storage units. The Bureau of Land Permits Section can be contacted at (217) 525-3300 for more information about RCRA closure. After Illinois EPA approval of your RCRA closure plan, your hazardous waste storage and treatments units must be closed in accordance with the approved RCRA closure plan, the Act, and the applicable 35 Ill. Adm. Code regulations.

18. By November 20, 2014, submit to the Illinois EPA's Bureau of Land Permits Section a copy of a detailed closure cost estimate for closure of the hazardous waste treatment and waste storage units.

19. By March 1, 2015, submit to the Illinois EPA a hazardous waste annual report for calendar year 2014. The report form and instructions supplied by the Illinois EPA must be used for this report. You can contact Hope Wright at (217) 785-2361 for more information about annual reports.

The written response to this Violation Notice must include information in rebuttal, explanation, or justification of each alleged violation and must be submitted to the Illinois EPA by certified mail, within 45 days of receipt of this Violation Notice. The written response must also include a proposed Compliance Commitment Agreement that commits to specific remedial actions, includes specified times for achieving each commitment, and may include a statement that compliance has been achieved.

SORLING NORTHRUP
ATTORNEYS

RECEIVED
SPRINGFIELD REGION
DEC 12 2014
Environmental Protection Agency
STATE OF ILLINOIS

Reply To:

1 North Old State Capitol Plaza, Suite 200
P.O. Box 5131
Springfield, IL 62705

P: 217-544-1144
F: 217-522-3173

www.sorlinglaw.com

Stephen F. Hedinger
Attorney
sfhedinger@sorlinglaw.com

December 10, 2014

- VIA CERTIFIED MAIL -

Illinois Environmental Protection Agency
Bureau of Land Field Operations Section
Springfield Field Office Staff, MC #10
1021 North Grand Avenue East
P. O. Box 19276
Springfield, IL 62794 - 9276

EPA-DIVISION OF RECORDS MANAGEMENT
RELEASABLE
JAN 20 2015
REVIEWER JRK

Attention: Steve Townsend

Re: **Violation Notice L-2014-01133**
LPC #0210600007 – The PAINT SHOP
LPC #0210605081 – EVERGREEN AVIATION
COMPLIANCE FILE

Dear Sirs:

This letter is the proposed Compliance Commitment Agreement of Robert Brandis, Michael Brandis, Brandis Aircraft, LLC, Evergreen Aviation, Inc., and the land trust that owns the property upon which the Brandis Aircraft facility is located (hereinafter collectively "Brandis"), in further response to the above-referenced Violation Notice. As you are aware, this correspondence follows the meeting held on November 20, 2014, pursuant to Section 31 of the Illinois Environmental Protection Act (the "Act"), 415 ILCS 5/31, and is being submitted pursuant to Section 31(a)(5) of the Act, 415 ILCS 5/31(a)(5).

Brandis proposes the following as its commitment to future compliance:

The referenced Violation Notice alleges that Brandis has operated hazardous waste storage and treatment units that require RCRA permitting, without having obtained those permits or meeting the requirements for such permits. As we understand the Agency's position, its allegation is that Brandis failed to comply with the 90 day accumulation requirements applicable to hazardous waste generators, thereby resulting in the area where hazardous waste accumulated becoming a hazardous waste storage unit. Further, as part of the process of reducing and eliminating a hazardous waste stream, Brandis used the solvent stripping machine that resulted in removal of the hazardous solvents present in the facility's rinse water, and ultimately the evaporation of most or all of that water; the Agency alleges that the stripping machine, in the context of Brandis's use of that machine, constitutes a hazardous waste treatment unit.

In order to come into compliance with the operation of the two alleged hazardous waste management units, Brandis proposes to secure the clean closure of both units. Closure requirements have already been pursued with respect to the hazardous waste storage area. All waste that had been stored in the area has been sent, pursuant to manifest, to a hazardous waste disposal facility. Further, the concrete floor under the storage has been cleaned and repaired. Brandis is still in the process of finalizing clean closure of both the hazardous waste storage unit and the hazardous waste treatment unit, and commits to finalizing those activities and providing the documentation and certification within 47 days following the date of this letter.

As discussed during the Section 31 meeting, Brandis understands and agrees that the solvent stripping machine will not be utilized until and unless Brandis obtains all necessary permits and authorizations for use of the machine, and/or modifies its operations in such a way that use of the machine will comply with all applicable laws and regulations.

Brandis further commits to future compliance with all hazardous waste generator requirements prescribed in 35 Ill. Adm. Code Section 722.134. Brandis has already implemented operational policies to ensure that accumulation times are documented and followed, required records are kept, and other generator obligations are met. Specifically, since no later than shortly after the May 16, 2014 inspection, Brandis has labeled all containers with hazardous waste with date of first accumulation, has established a marked and dedicated area for hazardous waste accumulation, has maintained records of waste accumulation and removal. Brandis is in the process of complying with the requirements of 35 Ill. Adm. Code 725 Subparts C and D (35 Ill. Adm. Code 728.107(a)(5) does not apply to Brandis's facility or activities). Brandis commits to providing documentation of the above within 47 days of the date of this letter.

Brandis's plan for immediate compliance therefore consists of the clean closure of the two identified hazardous waste management units, and full future compliance with all applicable requirements for short-term accumulation of generated hazardous wastes. Brandis is also considering a number of alternatives, including modifications of process activities, changes in the type and composition of paint stripper used, the possibility of obtaining a RCRA permit for the stripper machine, and the potential for obtaining an NPDES permit so as to qualify for the wastewater treatment exemption discussed in our previous correspondence. At any time that a decision is finalized concerning any of these alternatives, Brandis will, of course, seek and obtain all necessary permits and authorizations.

Brandis also commits to implement policies, and in fact has already implemented policies, to ensure the proper labeling and disposal of used oil, proper identification and disposal of any special waste produced at the facility, proper treatment of solvent contaminated rags, proper disposal of spent fluorescent bulbs, and proper disposal of all other waste materials generated at the facility, including plastic sheeting, paint booth filters, and paint related waste.

As you are aware, at the Section 31 meeting we discussed certain allegations of delivery of liquid materials to a carwash located in Taylorville, and we observed that our ability to respond to those allegations was limited by the fact that the Agency had not previously provided Brandis with sufficient details of those allegations. In response to that observation, following the meeting the Agency forwarded to Brandis the entire contents of its inspection file relating to the referenced Violation Notice, including a police report relating to the carwash allegations. Unfortunately, though, upon review of those additional materials, we can provide no further information or discussion beyond what we previously discussed. For one thing, although the Agency's allegations include reference to "car boy" containers, we find nothing in the police report or accompanying materials that reference such vessels. As previously discussed, the only incident that Brandis can think of concerning car boy containers did not involve any material generated through any commercial activities of Brandis Aircraft, but instead was merely innocuous household cleaner used for personal purposes. With respect to the allegations concerning blue plastic 55 gallon drums, we note that no allegation has been made of anyone observing any such drums being delivered to the carwash, or of any observation of spilling or discharge of any liquids in any unauthorized manner. We have already provided information concerning an occasion where blue barrels, empty and clean, were rinsed out at the carwash prior to being put to personal use, and the additional information does not provide any further enlightenment as to any particular circumstances that can be, or need to be, further explained.

Finally, at the Section 31 meeting, and in the Agency's prior correspondence, a number of documents were requested. Brandis commits, at this time, to providing the following additional materials within 47 days of the date of this letter:

> All manifests of hazardous wastes removed from the Brandis facility since May, 2014.
>
> Clean closure documentation, certification and request form for the hazardous waste storage unit.
>
> Clean closure documentation, certification and request form for the hazardous waste treatment unit.
>
> Documentation of compliance with 35 Ill. Adm. Code 725 Subparts C and D.
>
> Hazardous waste determinations for materials used in Brandis processes since May, 2014.
>
> Special waste determinations for materials used in Brandis processes since May, 2014.
>
> Facility operating record.
>
> Records of waste generation and waste removal from January 4, 2010 to the present.

We calculate 47 days from the date of this letter to be Monday, January 26, 2015.

Brandis believes that the above proposed Compliance Committee Agreement matches the Suggested Resolutions that accompanied the Agency's September 19, 2014 correspondence.

Please feel free to contact the undersigned if you have any questions concerning this proposal.

Very truly yours,

Stephen F. Hedinger
SFH/dc

Fred C. Prillaman

cc: Bob Brandis
Brandis Aircraft
Mike Brandis
Andrews Engineering, Inc.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-2829
PAT QUINN, GOVERNOR . LISA BONNETT, DIRECTOR

December 26, 2014

CERTIFIED MAIL #7012 0470 0001 3001 5195
CERTIFIED MAIL #7012 0470 0001 3001 5201
RETURN RECEIPT REQUESTED

Mr. Stephen Hedinger
Sorling Northrup, Attorneys
1 North Old State Capital Plaza
Suite 200
P. O. Box 5131
Springfield, Illinois 62705

Mr. Fred Prillaman
Mohan, Alewelt, Prillaman & Adami
1 North Old State Capital Plaza
Suite 325
Springfield, Illinois 62701-1323

Re: Notice of Non-Issuance of a Compliance Commitment Agreement
Violation Notices: L-2014-01131, L-2014-01132, L-2014-01133, L-2014-01134 and L-2014-01135

0
LPC #0210600007- Christian County
Taylorville/The Paint Shop
(aka Brandis Aircraft)
ILD982621690
Compliance File

LPC #0210605081- Christian County
Taylorville/Evergreen Aviation
Compliance File

EPA-DIVISION OF RECORDS MANAGEMENT
RELEASABLE
JAN 20 2015
REVIEWER JRM

Dear Mr. Hedinger and Mr. Prillaman:

The Illinois Environmental Protection Agency ("Illinois EPA") has reviewed the proposed Compliance Commitment Agreement ("CCA") terms dated December 10, 2014, and submitted by you on behalf of your clients, Robert Brandis, Michael Brandis, Brandis Aircraft, LLC, Evergreen Aviation, Inc., and the land trust that owns the property upon which the Brandis Aircraft facility is located. The proposed CCA terms were submitted in response to the Violation Notices dated September 19, 2014. The Illinois EPA has decided not to issue a proposed CCA for these violations. Due to the nature and seriousness of the violations, the Illinois EPA has determined that these violations may not be able to be resolved without the involvement of the Office of the Attorney General, the Christian County State's Attorney, or the United States Environmental Protection Agency.

Because the violations remain the subject of disagreement between the Illinois EPA and your clients, this matter will be considered for referral to the above-referenced prosecutorial authorities for formal enforcement action and the imposition of penalties.

Despite the decision not to issue a CCA, the Illinois EPA encourages your clients to complete RCRA closure, and to return to full compliance with the Illinois Environmental Protection Act, and 35 I.A.C. Subtitle G as soon as possible.

Written communications should be directed to:

Illinois Environmental Protection Agency
Springfield Field Office Staff, MC #10
1021 North Grand Ave. East, P. O. Box 19276
Springfield, Illinois 62794-9276
Attention: Steve Townsend

Please include the Violation Notice Numbers L-2014-01131, L-2014-01132, L-2014-01133, L-2014-01134, L-2014-01135, and the Site Identification Numbers 0210600007 and 0210605081 on all written communications.

Questions regarding this matter should be directed to Scott Sievers at (217) 782-5544.

Sincerely,

Paul Purseglove

Paul Purseglove, Manager by DJ
Field Operations Section
Bureau of Land

PMP/SCT/cp(N:\REG\Springfield\SPF Region BOL_SHARE\SCT\TEMP FOR DJ\Brandis\Brandis CCA Notice of Non-Issuance.docx)

cc: DLPC/Division File
DLPC/FOS Springfield Region

ec: DLC, Scott Sievers

Bureau of Land – Field Operations Section
RCRA Inspection Report

General Facility Information

BOL ID:	0210600007	Region:	Springfield
USEPA ID:	ILD982621690	County:	Christian
Site Name:	Paint Shop, The	Phone:	217-824-8032
Address:	2207 S Spresser St	Latitude:	39.52891
City/State/Zip:	Taylorville, IL 62568-9291	Longitude:	-89.3255
Inspection Date:	2/27/2018		

Observations

Time	09:09 - 11:09
Weather Conditions (Description)	Sunny - dry to Slightly moist
Temperature (°F)	59
Samples Collected (Yes/No)	no
Number of Samples Collected (Count)	N/A
Photos Taken (Yes/No)	17
Amount of Waste (Cubic Yards)	-
Number of Tires (Count)	None

Facility Type

Most Recent Notification Date	Notified As	Regulated As
2/26/2015	SQG	LQG/TSD

Evaluation Type

Compliance Evaluation Inspection, Follow-Up Inspection

Inspection Participants

Participant	Agency/Bureau	Phone
James Richardson	Springfield IEPA Legal Counsel	217/782-3397
Melissa Silva	Springfield IEPA Field Operations Inspector	217/782-3397
Paul Eisenbrandt	Springfield IEPA Field Operations Inspector	217/782-3397
Steve C Townsend	Springfield IEPA Field Operations Inspector	217/782-3397

Persons Interviewed

Person	Phone	Email
Mr. Michael Brandis	217/824-8032	Not Listed
Mr. Robert Brandis	217/824-8032	Not Listed

Owner	Operator
Paint Shop, The 2207 S Spresser Taylorville, IL 62568	Paint Shop, The Robert Brandis 2207 S Spresser

	Taylorville, IL 62568

Part B Permit					
Application Date	Expiration Date	Log #	Current Mod #	Issue Date	Mod Issue Date

Active Enforcement Orders					
CACO	Consent Decree	CAFO	IPCB	Federal Court	State Court

TSD Activity Summary				
Activity Process	On Part B	Ever Done	Closed	Done During Inspection
S01 - Container	No	Yes	No	No
T04 - Other	No	Yes	No	No
S02 - Tank	No	Yes	Yes	No

Executive Summary

A CEI was conducted at the above refenced site both in accordance with the Agency's agreement with USEPA for FY2018 and as a follow-up to inspections conducted in 2014. The inspections conducted in 2014 resulted in violations that remained unresolved. There are two adjacent facilities that share an office and operate together to refurbish and service aircraft. Evergreen Aviation (0210605081) and The Paint shop IL982621690 (0210600007) are the names and numbers of these facilities, which are together known to this Agency as Brandis Aircraft. Both facilities were inspected on February 27, 2018 (See report for Evergreen Aviation (0210605081). There were violations noted. The Paint Shop had a hazardous waste generation rate that exceeded 2200 lb. per month some months and is regulated as a large quantity generator based on generation rate. This facility was not in compliance with the regulations for this type of generator and did not qualify for the permit exemption of 35 IAC 722.134(a), and is therefore a Storage facility in need of a RCRA permit.

Inspection Narrative

Because both this facility and (Evergreen Aviation - 0210605081) operate in conjunction with one another, the time listed for both inspections are identical. The physical site inspections were conducted one right after the other and the interviews were conducted both during the physical site inspections and simultaneously for both sites following the site tours in the office located in the Evergreen Aviation hangar.

Upon arrival at the facilities, Paul Eisenbrandt, Melissa Silva, and I (Steve Townsend) of this Agency informed the operators that we were there to do an inspection. After a brief discussion regarding the nature of the inspection, it was decided to inspect The Paint Shop first.

A PPB Rae air monitoring device was activated outside The Paint Shop hangar. During the previous sampling inspection conducted in 2014, it was determined that venting the hangar (opening the doors) should be done as a precaution. The above Agency personnel donned respirators prior to entry as a protective measure. The hangar was not vented during this inspection. Both Michael Brandis and Bob Brandis accompanied us on the physical site inspection and answered questions.

The following processes are done on-site.

Aircraft De-painting – a chemical stripper is used to remove paint from aircraft. Stripper is removed from the aircraft by physical removal (wiping off) and rinsing. Spent stripper and rinse water are placed in drums, which are accumulated along the south wall of the Paint Shop (see Photo 002 and 003), and shipped off-site as hazardous wastes under the name Brandis Aircraft using the site ID numbers for the Paint Shop (see Photos 014 through 017). Spent stripper with water was previously placed in drums and treated on-site. This treatment was the subject of previously cited violations. The treatment unit is no longer in use (see Photo 001). Photo 006 depicts a floor drain which, according to the facility, does not to have an outflow used to collect waste from stripping.

Masking - Aircraft are masked to prevent certain areas from receiving paint. Dried spent masking agents are placed in the general refuse for disposal.

Paint preparation – Aircraft are wiped with Methyl Ethyl Ketone (MEK) prior to painting to help paint adherence. Spent rags are placed in a self-closing metal pail (see Photos 009 and 10).

Painting – Aircraft are coated with an epoxy type aircraft "paint" which meets FAA requirements.

Paint Clean-up –Paint equipment is cleaned on-site using a small pail of solvent spent liquid. Spent solvent is added to paint solvent drum in the satellite accumulation area located in the north part of The Paint Shop hangar (see Photo 006). Some of the clean-up waste becomes solidified and, after identified as spent paint chips (epoxy), are added to a drum in the satellite accumulation area in the southeast of the Paint Shop hangar (see Photo 004).

Floor washing – A floor cleaning machine with a water based ZEP cleaner is used to clean floors. No waste is generated by this process to date.

Paint booth filters are changed as needed. Spent filters are put into the satellite accumulation area in the north part of the Paint Shop hangar (see Photo 005 and 007).

At times, paints become old and must be discarded. Such paints are placed in a lined container located in the northwest part of The Paint Shop hangar.

Spent stripper with water was previously placed in drums and treated on-site. This treatment was the subject of previously cited violations. The treatment unit is no longer in use (see Photo 001). Photo 006 depicts a floor drain which, according to the facility, does not to have an outflow used to collect waste from stripping.

Two additional photos were taken north of The Paint Shop hangar depicting the solid waste dumpster which appeared to contain only solid waste (see Photo 012) and an area where drums of unknown waste had previously been found in 2014 (see Photo 013). Drums of waste were no longer there.

Waste from shared office space is listed under Evergreen Aviation as the office is in the Evergreen hangar.

Following the site tour of The Paint Shop, the Evergreen Aviation hangar was inspected (see report Evergreen Aviation -0210605081).

After the on -site tours, a check of documents and continuation of the interview process was done. Inspection logs for both The Paint Shop (required) and Evergreen Aviation were available and appeared adequate. Personnel Training records were also present and appeared adequate. According to Michael Brandis, several required documents were being used by their consulting engineer to update their required records including some manifests, their emergency procedures (contingency plan), and letters to local emergency response organizations. As a result, the following required items were unavailable on-site during the inspection. Items missing included a contingency plan and copies of letters to hospitals, police, and fire departments.

Mr. Mike Brandis wrote a list of items I needed and I requested that these items be emailed or sent via mail to me. As of the day this report was written I have not received any of the requested items.

Summary of Apparent Violation(s)

Summary of Apparent Violation(s)			
Status	Date	Violation	Narrative
Resolved	11/12/2014	725.116(a)	Training records seen during site evaluation.
Resolved	8/11/2014	809.201	No longer hauling any wastes
Resolved	12/23/2014	725.115(b)	Inspection log-schedule seen during site evaluation.

Resolved	8/29/2003	722.111	Wastes being generated as on February 27, 2018 had waste determinations.
Resolved	8/11/2014	809.301	No longer delivering any wastes.
Resolved	8/29/2003	722.111	Wastes being generated as on February 27, 2018 had waste determinations.
Resolved	5/16/2014	809.302	No longer delivering any wastes.
Resolved	11/12/2014	725.116(a)	Training records seen during site evaluation.
Resolved	11/12/2014	808.121(a)	Wastes being generated as on February 27, 2018 had waste determinations.
Resolved	11/12/2014	21(j)	No longer transporting any wastes.
Resolved	12/23/2014	739.122	Used oil not generated at The Paint Shop, Evergreen Aviation was handling oil properly.
Resolved	12/23/2014	725.115(b)	Inspection log-schedule seen during site evaluation.
Resolved	12/23/2014	725.113(a)	A detailed waste analysis based on collected samples was provided after the 2014 inspections.
Resolved	8/11/2014	809.301	No longer delivering any wastes
Continuing	11/12/2014	725.115(a)	Contingency Plan was not available on-site.
Continuing	11/12/2014	725.242(a)	Written detailed closure cost estimate was not on-site.
Continuing	11/12/2014	725.212(a)	A written closure plan for storage conducted in 2014 was not available on-site.
Continuing	11/12/2014	725.173	A complete operating record was not available on-site.
Continuing	11/12/2014	725.151(a)	Contingency Plan was not available on-site.
Continuing	11/12/2014	725.137	Letters familiarizing police, fire departments, emergency response teams and hospitals with up to date required information were not on-site.
Continuing	11/12/2014	21(i)	Still generating hazardous waste in violation of board regulations.
Continuing	11/12/2014	21(f)(2)	Hazardous waste was stored and treated in violation of the regulations. The TSD has not completed closure.
Continuing	11/12/2014	703.121(b)	No RCRA TSD permit has been applied for or obtained.
Continuing	11/12/2014	703.150(a)	No RCRA TSD permit has been applied for or obtained
Resolved	11/12/2014	722.134(a)	Waste containers were compatible, closed, marked, dated, in good condition and inspected.
Continuing	11/12/2014	725.113(b)	A written waste analysis plan was not available on-site.
Continuing	11/12/2014	21(f)(1)	Conduct any hazardous waste-storage, hazardous waste-treatment or hazardous waste-disposal operation without a RCRA permit

Attachment Listing		
ID	Type	Description
No Attachments		

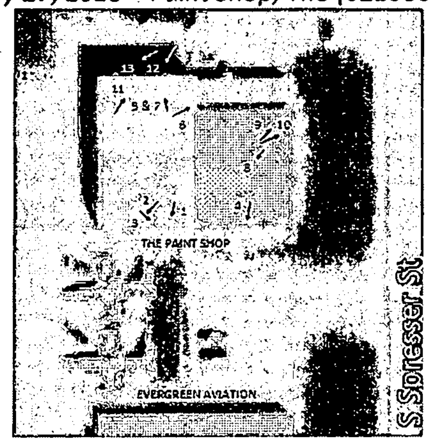
Waste Disposition Form									
Facility Name:	Paint Shop, The					**USEPA ID:**	ILD982621690		
Inspection Date:	2/27/2018					**IEPA ID:**	0210600007		
Waste Name	Generating Process	Waste Determination	Waste Type	HW Annual Report	Amount On-Site	Generation Rate	Last Ship Date	Destination	
Discontinued Use-Old Paint	Inventory Clean-out	Generator Knowledge	D001, D035	Yes	less than 1 container	Varies		To be determined	
Paint Related Wastes -solvent	Clean-up from plane painting	Analysis	F002, F005, D005, D006, D007	Yes	less than 1 container	55 to 110 gallons/year	1/25/2018	Clean Harbours	
Paint Related Wastes -chips	Clean-up from plane painting	Analysis	F002, F005, D005, D006, D007	Yes	less than 1 container	55 to 110 gallons/year	10/12/2017	Tradebe Trmnt & Recycling	
Spent Stripper and Waste Water	De-painting planes	Analysis	F002, F005, D006, D007	Yes	275 gallons	400 gallons/month	1/25/2018	Clean Harbours or Tradebe Trmnt & Recycling	
Spent Masking Agents	Plane painting	Generator Knowledge	General Refuse	Yes	General Refuse Landfill	Varies		Local landfill	
Spent Paint booth filters	Changing Filters	Generator Knowledge	Undet	No	2 filters	Varies -as needed		Safety Kleen	
Universal Waste Lamps	Change Lights	Generator Knowledge	Universal Waste	Yes	none	infrequent - varies		to be determined	
Used Solvent Wipe Rags	Preparation for Plane Painting	Generator Knowledge	used rag	No	Less than 5 gal	Varies		AirMark - Laundered	

R000772

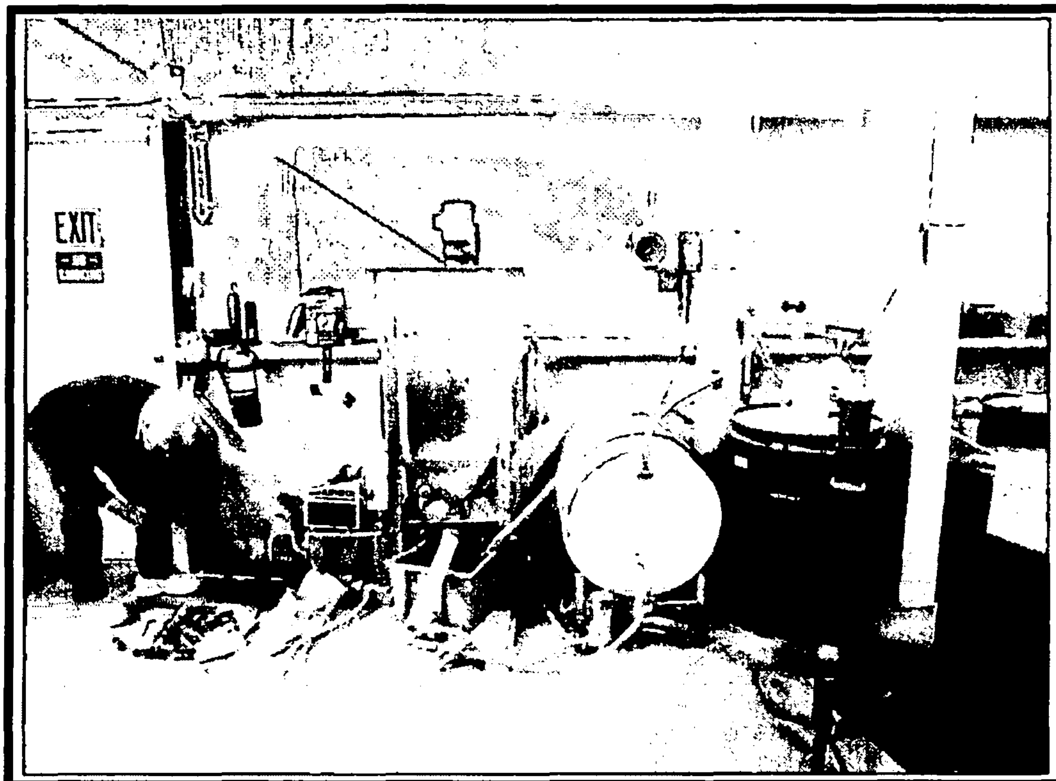
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

Site Diagram(s)

Site Diagram 1: February 27, 2018 • Paint Shop, The (0210600007) • Christian County



Digital Photographs



Site: Paint Shop, The (0210600007)
Christian County

Photo ID: 1
Photo Date: 2/27/2018
Photo Time: 09:33:04
Direction: S
Taken By: Steve Townsend

Stripper treatment unit - no longer being used.

Site: Paint Shop, The (0210600007)
Christian County

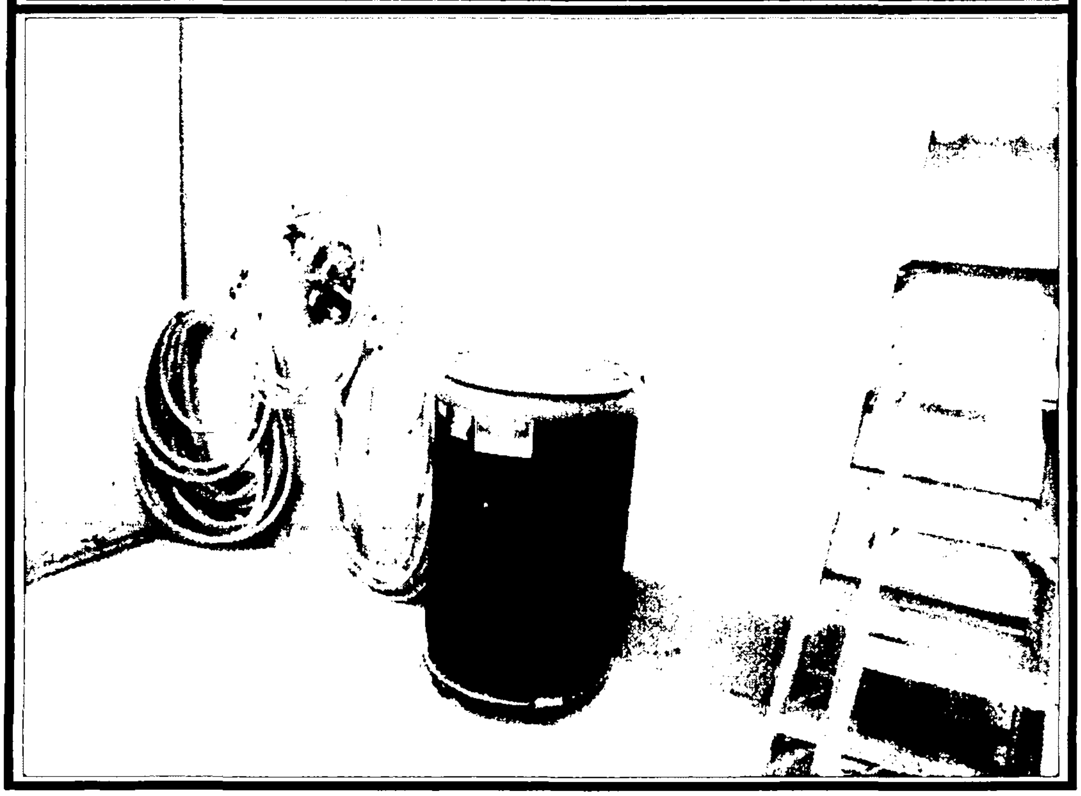
Photo ID: 2
Photo Date: 2/27/2018
Photo Time: 09:33:10
Direction: SW
Taken By: Steve Townsend

Spent stripper and rinse water drums along the south wall.

Site: Paint Shop, The
(0210600007)
Christian County

Photo ID: 3
Photo Date: 2/27/2018
Photo Time: 09:33:26
Direction: SE
Taken By: Steve Townsend

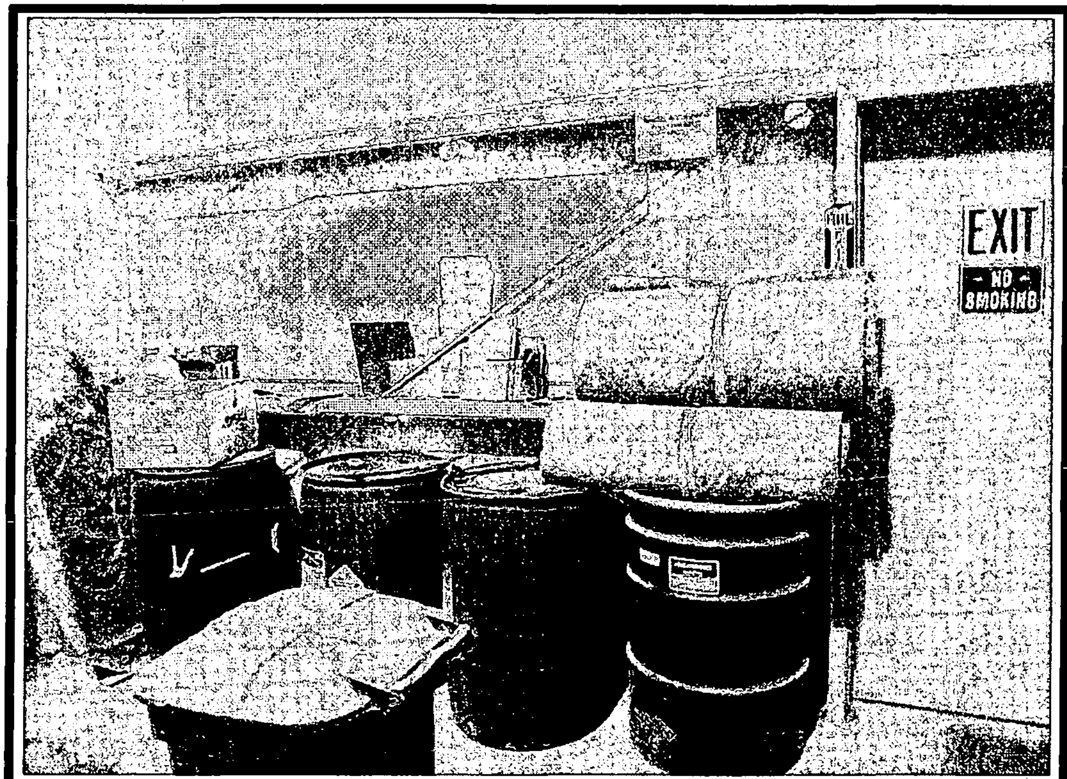
Spill kit on top of spent stripper and rinse water in drums along the south wall



Site: Paint Shop, The
(0210600007)
Christian County

Photo ID: 4
Photo Date: 2/27/2018
Photo Time: 09:36:26
Direction: S-SE
Taken By: Steve Townsend

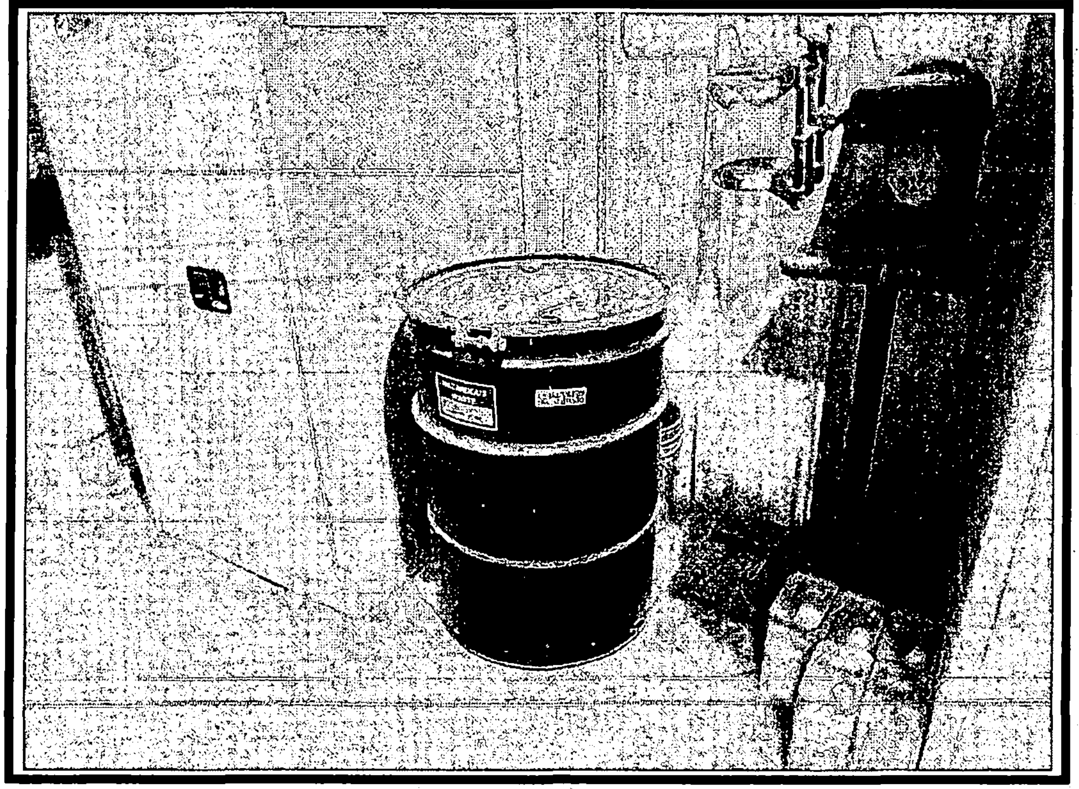
Paint chips accumulation area.



Site: Paint Shop, The
(0210600007)
Christian County

Photo ID: 5
Photo Date: 2/27/2018
Photo Time: 09:38:56
Direction: N-NW
Taken By: Steve Townsend

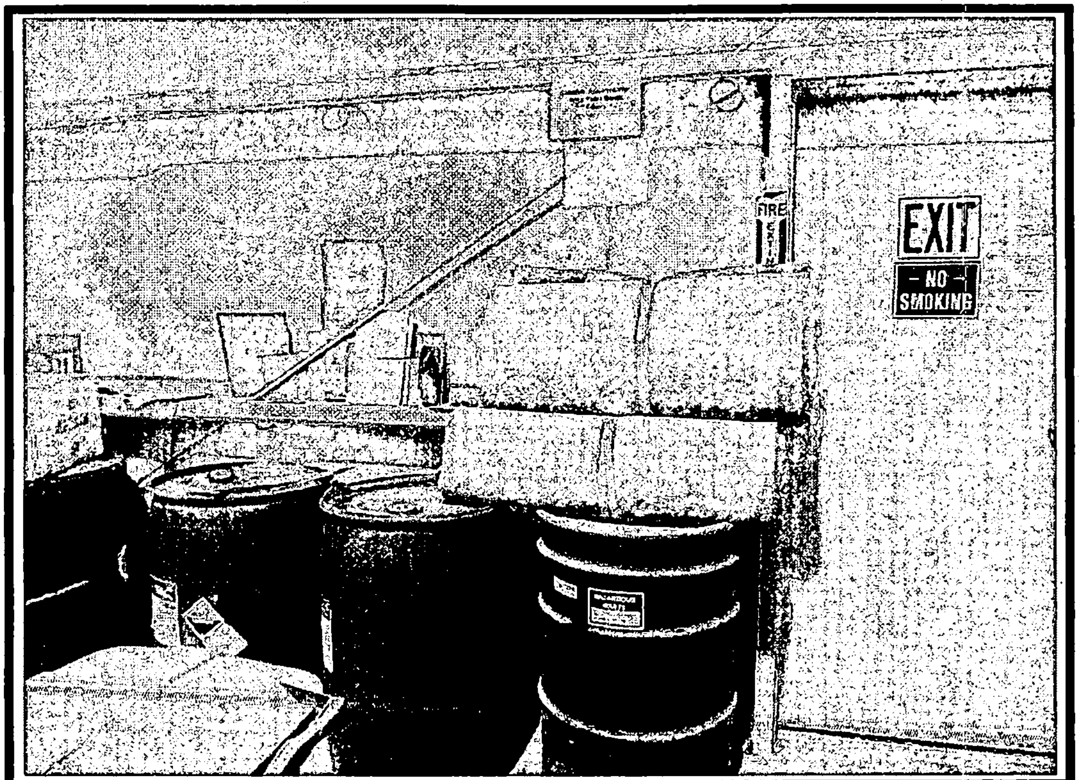
Spent paint booth filters.



Site: Paint Shop, The
(0210600007)
Christian County

Photo ID: 6
Photo Date: 2/27/2018
Photo Time: 09:39:03
Direction: NE
Taken By: Steve Townsend

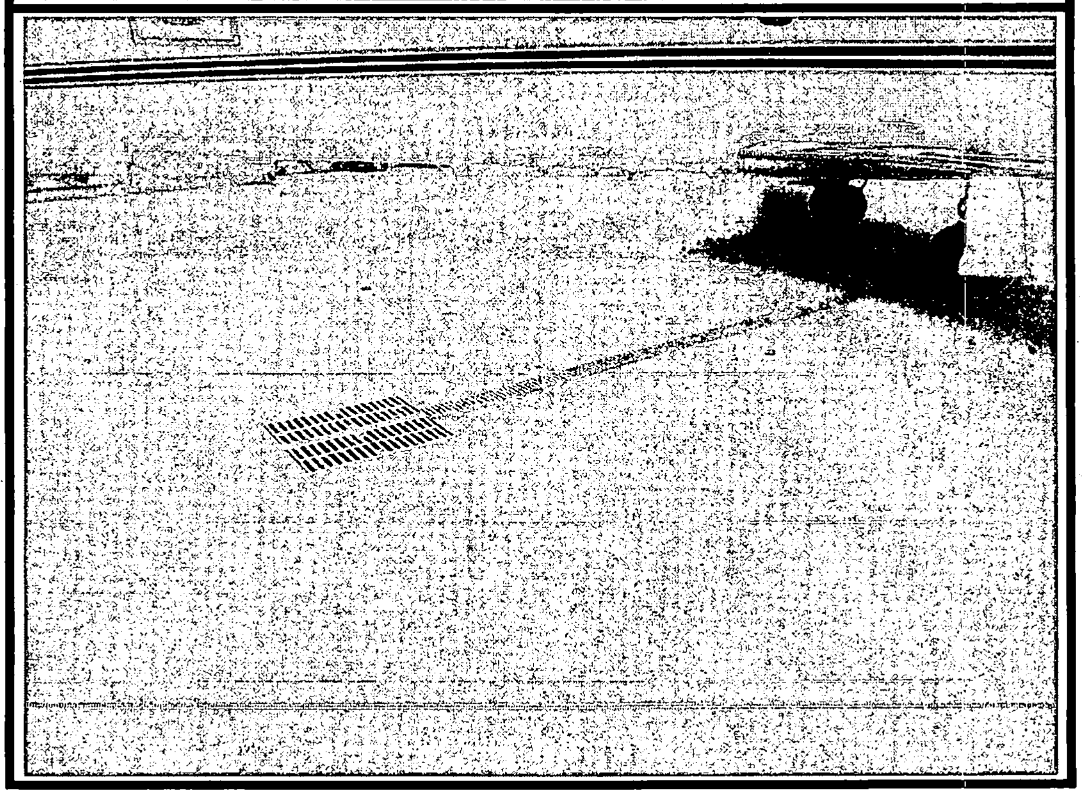
Spent solvent from Paint clean-up.



Site: Paint Shop, The
(0210600007)
Christian County

Photo ID: 7
Photo Date: 2/27/2018
Photo Time: 09:39:08
Direction: N-NW
Taken By: Steve Townsend

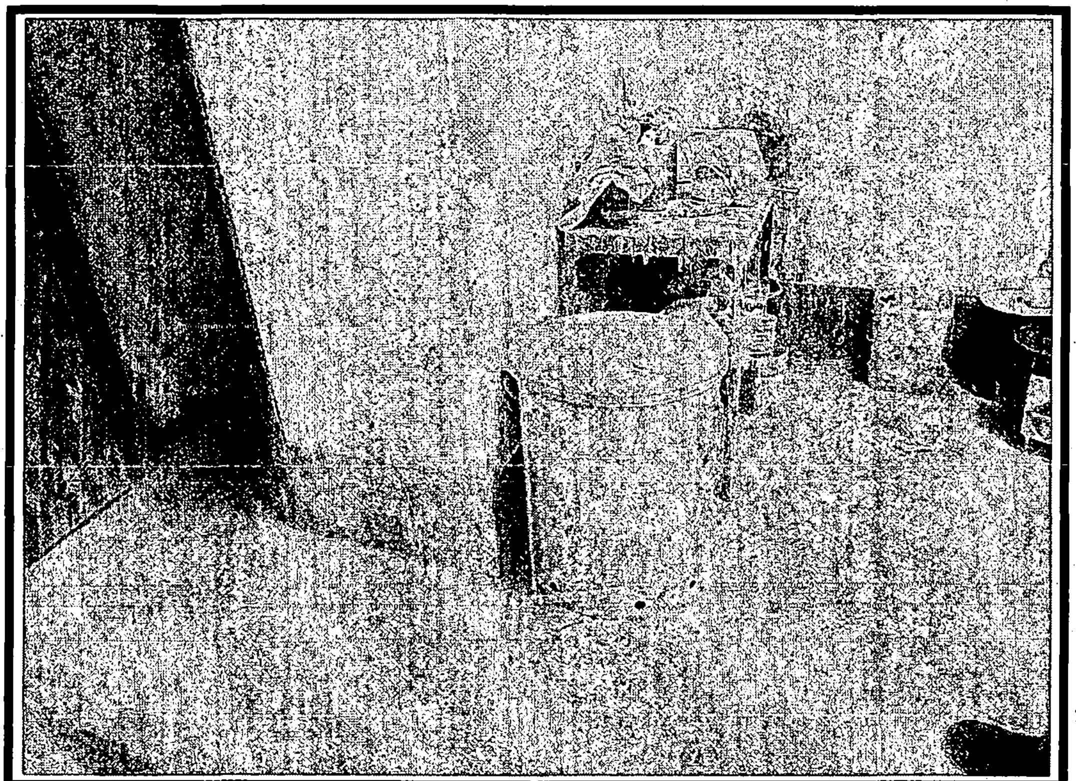
Spent paint booth filters.



Site: Paint Shop, The
(0210600007)
Christian County

Photo ID: 8
Photo Date: 2/27/2018
Photo Time: 09:40:44
Direction: SW
Taken By: Steve Townsend

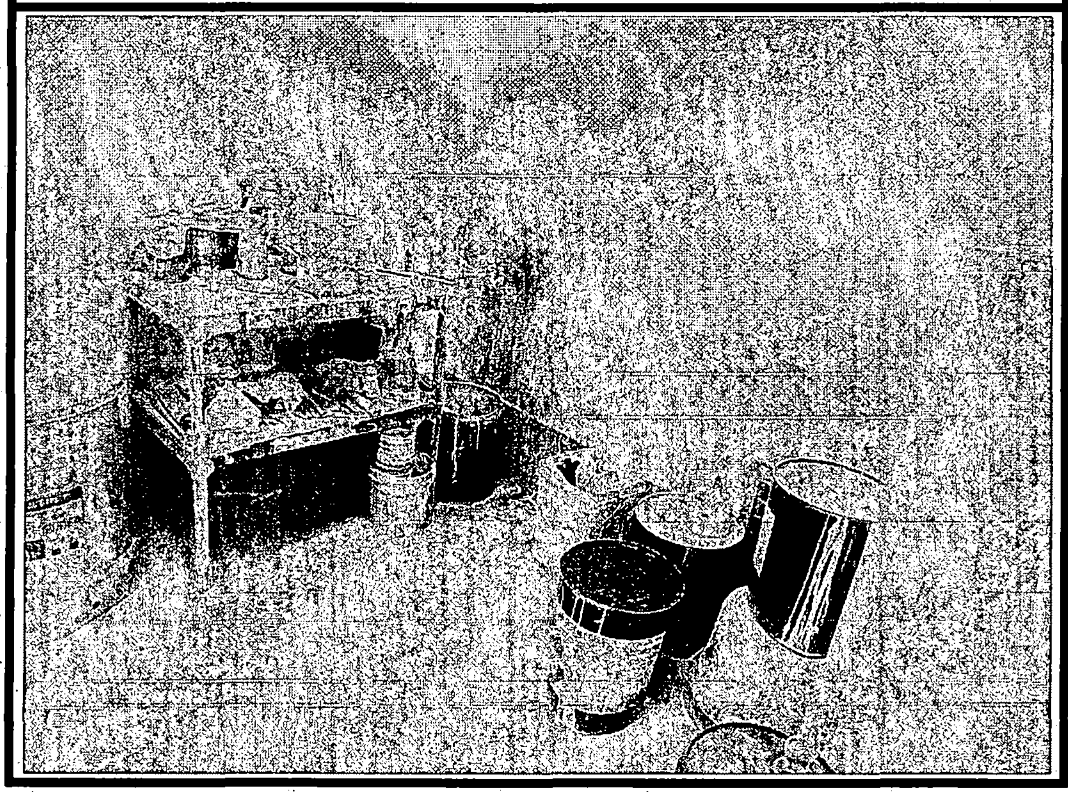
Floor Drain - non-discharge accumulation basin.



Site: Paint Shop, The
(0210600007)
Christian County

Photo ID: 9
Photo Date: 2/27/2018
Photo Time: 09:41:12
Direction: NE
Taken By: Steve Townsend

Used solvent wipe rags from plane paint prep.



Site: Paint Shop, The
(0210600007)
Christian County

Photo ID: 10
Photo Date: 2/27/2018
Photo Time: 09:42:17
Direction: E-NE
Taken By: Steve Townsend

Used solvent wipe rags from plane paint prep.

Site: Paint Shop, The
(0210600007)
Christian County

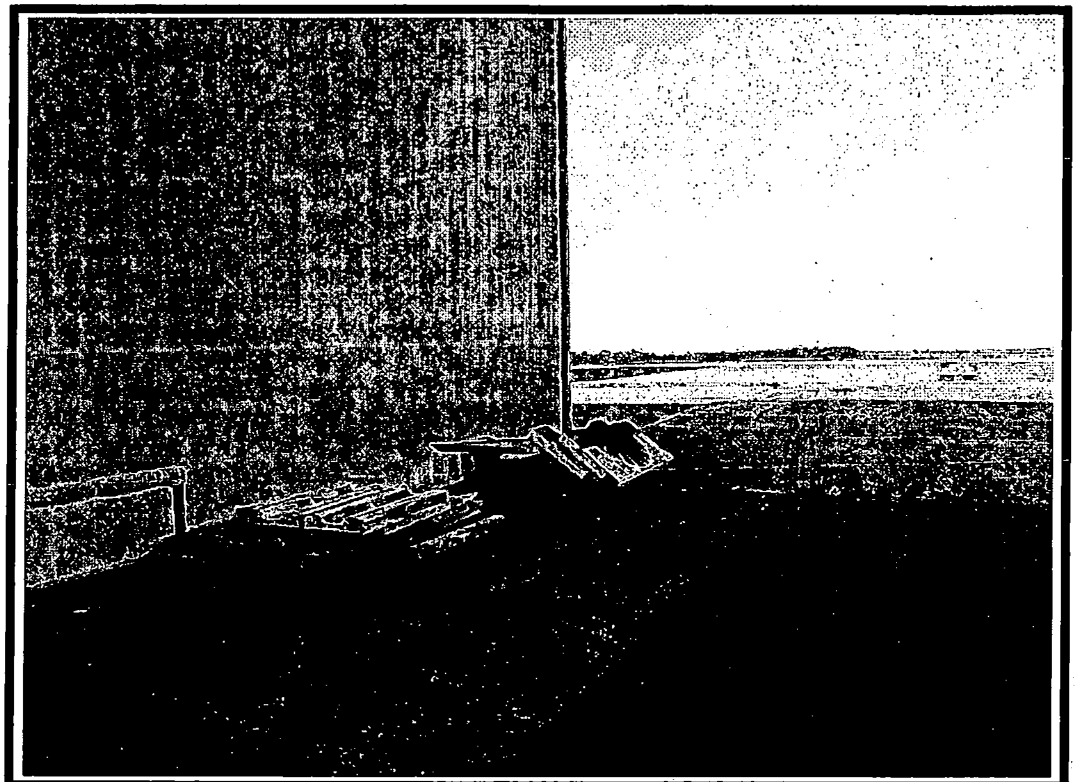
Photo ID: 11
Photo Date: 2/27/2018
Photo Time: 09:45:29
Direction: NE
Taken By: Steve Townsend

Old-discontinued use paint.

Site: Paint Shop, The
(0210600007)
Christian County

Photo ID: 12
Photo Date: 2/27/2018
Photo Time: 09:48:23
Direction: S-SW
Taken By: Steve Townsend

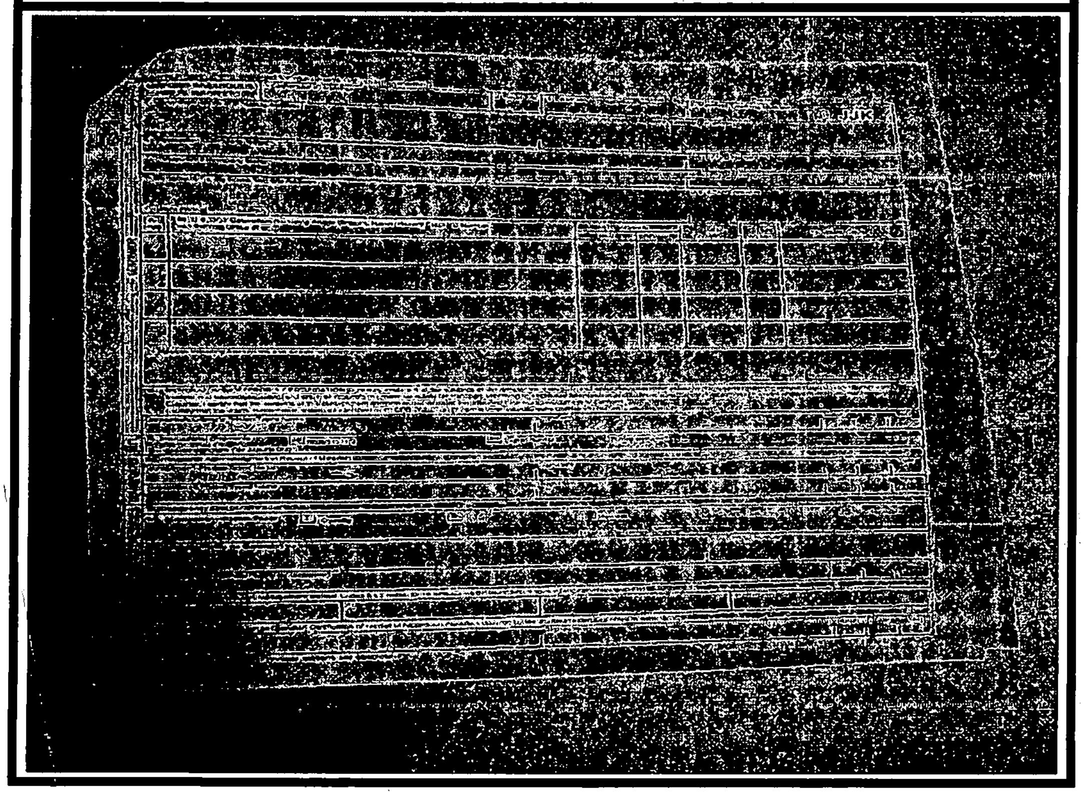
Solid waste dumpster.



Site: Paint Shop, The
(0210600007)
Christian County

Photo ID: 13
Photo Date: 2/27/2018
Photo Time: 09:48:27
Direction: SW
Taken By: Steve Townsend

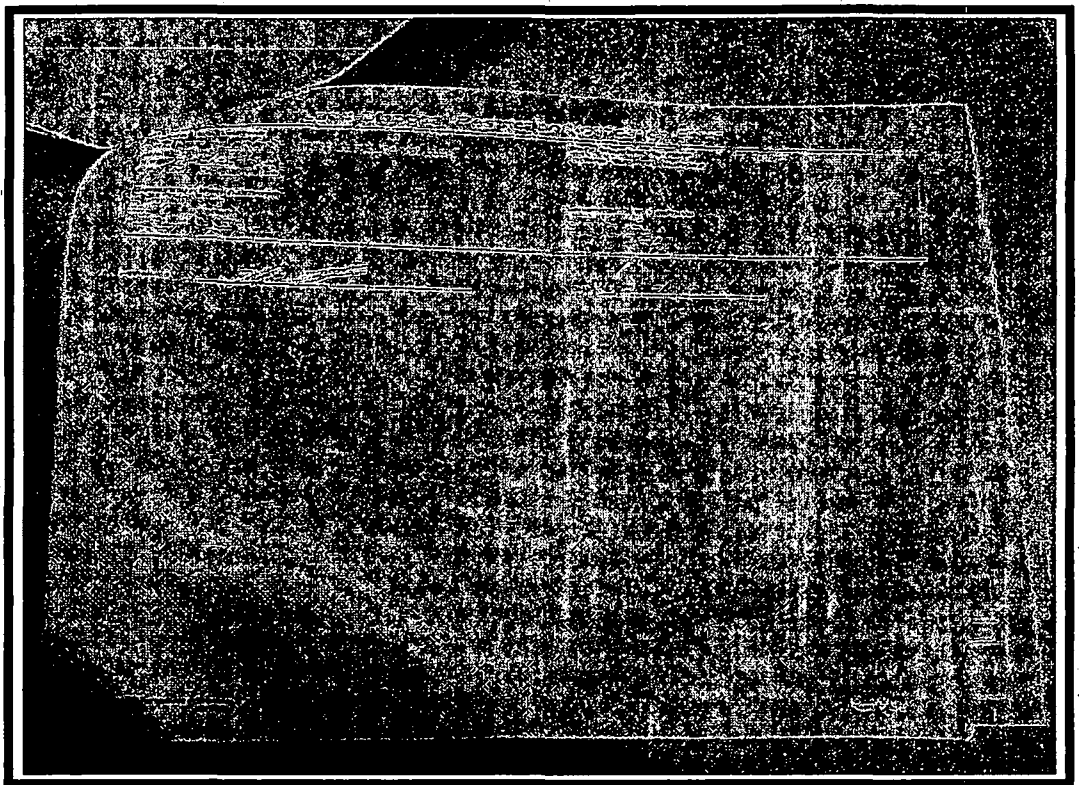
Previous waste drum staging area.



Site: Paint Shop, The
(0210600007)
Christian County

Photo ID: 14
Photo Date: 2/27/2018
Photo Time: 10:50:46
Direction: Down
Taken By: Steve Townsend

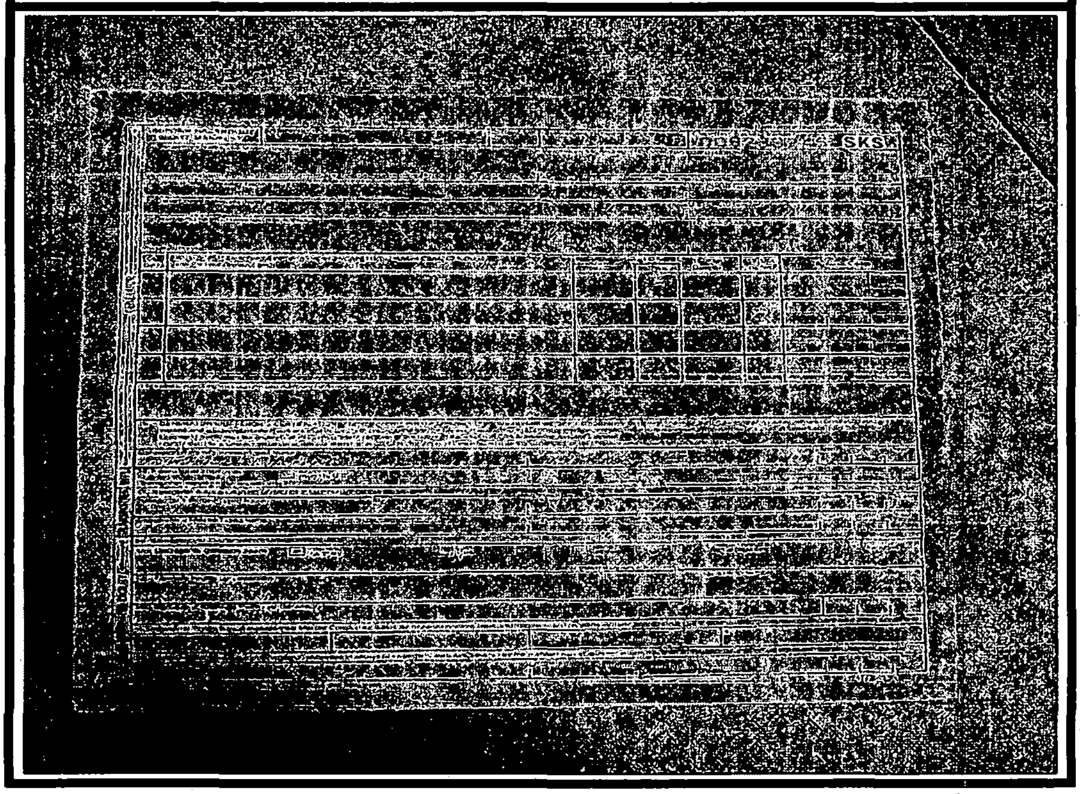
Manifest



Site: Paint Shop, The
(0210600007)
Christian County

Photo ID: 15
Photo Date: 2/27/2018
Photo Time: 10:51:24
Direction: Down
Taken By: Steve Townsend

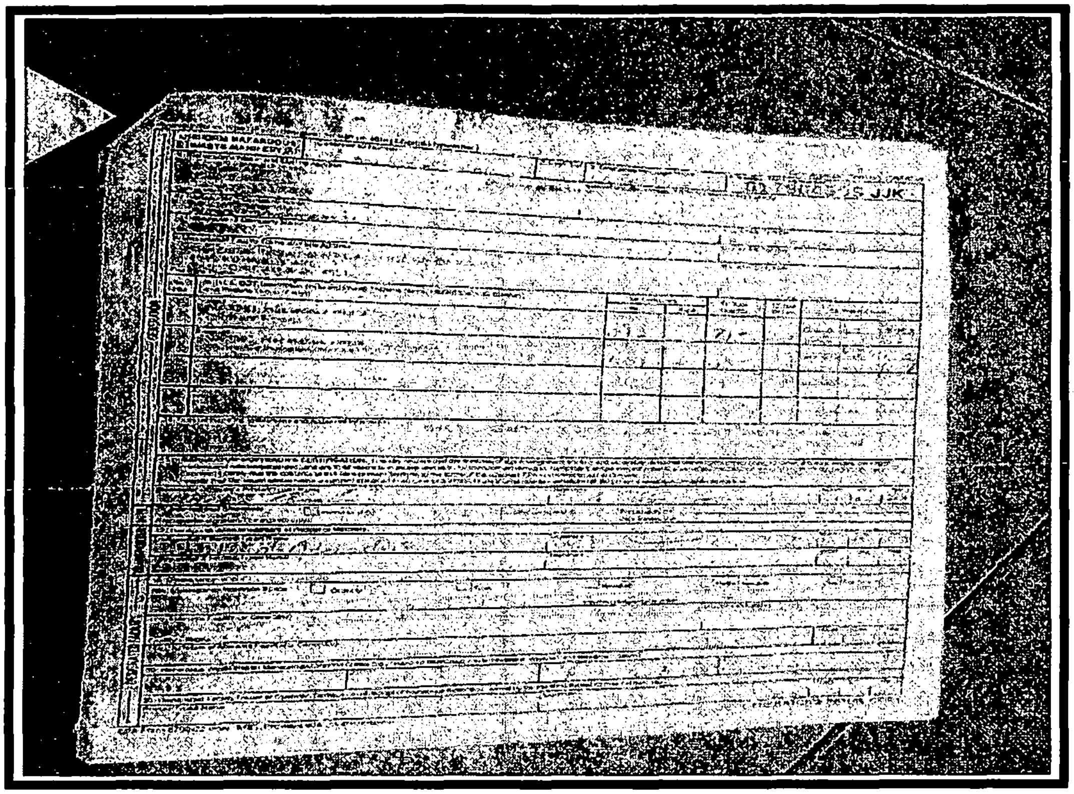
LDR Signature Page



Site: Paint Shop, The
(0210600007)
Christian County

Photo ID: 16
Photo Date: 2/27/2018
Photo Time: 10:51:54
Direction: Down
Taken By: Steve Townsend

Manifest



Site: Paint Shop, The (0210600007)
Christian County

Photo ID: 17
Photo Date: 2/27/2018
Photo Time: 10:52:39
Direction: Down
Taken By: Steve Townsend

Manifest

Watson, Rob

From: Watson, Rob
Sent: Monday, December 28, 2020 3:30 PM
To: Sinnott, Bill
Subject: FW: RCRA Closure C-556

FYI – for recent Closure Cert for C-556

Rob Watson, P.E.
RCRA Unit Manager
Permit Section, Bureau of Land
Illinois EPA
217.524.3265
Rob.Watson@illinois.gov
Please consider the environment before printing this e-mail

From: Watson, Rob
Sent: Monday, June 22, 2020 10:47 AM
To: Joyce Munie <jmunie@andrews-eng.com>
Subject: RE: RCRA Closure

Joyce,

Yup, girls have been home since early spring, they are really ready to get out of the house and return to their schools. !

The only thing I found was a closure log no C-556 for the Paint Shop (0210600007) I didn't find any closure related info for 0210605081 Evergreen Aviation.

Sorry, hope this helps.

Rob Watson, P.E.
RCRA Unit Manager
Permit Section, Bureau of Land
Illinois EPA
217.524.3265
Rob.Watson@illinois.gov
Please consider the environment before printing this e-mail

From: Joyce Munie <jmunie@andrews-eng.com>
Sent: Wednesday, June 17, 2020 10:58 AM
To: Watson, Rob <Rob.Watson@Illinois.gov>
Subject: [External] RCRA Closure

Rob,

Hope all is well in the Watson household. I assume the girls are home.

I am working with Brandis on an old enforcement case that has never been closed. 0210600007 and 0210605081. They believe that they submitted closure documents in 2014 or 2015. I FOIA'd the file and found nothing in the Permit File for that time frame. I am expanding my FOIA search. Is there a database available to the public to search for permit submittals?

Do you still have a checklist available for RCRA closure?

Any help would be appreciated.

Joyce

Joyce L. Munie, P.E.
Senior Project Engineer
3300 Ginger Creek Dr., Springfield, IL 62711
(o) 217-787-2334
jmunie@andrews-eng.com

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Watson, Rob

From: Watson, Rob
Sent: Monday, December 28, 2020 3:31 PM
To: Sinnott, Bill
Subject: FW: RCRA Closure
Attachments: image001.png

FYI – for recent Closure Cert for C-556

Rob Watson, P.E.
RCRA Unit Manager
Permit Section, Bureau of Land
Illinois EPA
217.524.3265
Rob.Watson@illinois.gov
Please consider the environment before printing this e-mail

-----Original Message-----
From: Joyce Munie <jmunie@andrews-eng.com>
Sent: Friday, October 16, 2020 7:54 AM
To: Watson, Rob <Rob.Watson@Illinois.gov>
Subject: [External] Re: RCRA Closure

Rob,

I have made numerous FOIA requests for the Permit file related to Closure Log # C-556, and any Permit file for the Paint Shop (0210600007) and just to cover bases the Permit file for 0210605081.

But I have not found anything. Can you assist?

Thanks, Joyce

From: Joyce Munie
Sent: Tuesday, June 23, 2020 8:00 AM
To: Watson, Rob
Subject: Re: RCRA Closure

Thanks

From: Watson, Rob <Rob.Watson@Illinois.gov>
Sent: Monday, June 22, 2020 10:47:11 AM
To: Joyce Munie

Subject: RE: RCRA Closure

Joyce,

Yup, girls have been home since early spring, they are really ready to get out of the house and return to their schools. !

The only thing I found was a closure log no C-556 for the Paint Shop (0210600007) I didn't find any closure related info for 0210605081 Evergreen Aviation.

Sorry, hope this helps.

Rob Watson, P.E.

RCRA Unit Manager

Permit Section, Bureau of Land

Illinois EPA

217.524.3265

Rob.Watson@illinois.gov

From: Joyce Munie <jmunie@andrews-eng.com>
Sent: Wednesday, June 17, 2020 10:58 AM
To: Watson, Rob <Rob.Watson@Illinois.gov>
Subject: [External] RCRA Closure

Rob,

Hope all is well in the Watson household. I assume the girls are home.

I am working with Brandis on an old enforcement case that has never been closed. 0210600007 and O210605081. They believe that they submitted closure documents in 2014 or 2015. I FOIA'd the file and found nothing in the Permit File for that time frame. I am expanding my FOIA search. Is there a database available to the public to search for permit submittals?

Do you still have a checklist available for RCRA closure?

Any help would be appreciated.

Joyce

[Joyce Munie signature]

R000788

Watson, Rob

From: Watson, Rob
Sent: Monday, December 28, 2020 3:30 PM
To: Sinnott, Bill
Subject: FW: Checking on address

FYI – for recent Closure Cert for C-556

Rob Watson, P.E.
RCRA Unit Manager
Permit Section, Bureau of Land
Illinois EPA
217.524.3265
Rob.Watson@illinois.gov
? Please consider the environment before printing this e-mail

-----Original Message-----
From: Watson, Rob
Sent: Friday, October 23, 2020 11:28 AM
To: Joyce Munie <jmunie@andrews-eng.com>
Subject: RE: Checking on address

Hey Joyce,
Yup - this is my correct work address.

In response to your email from 10/16/2020; Unfortunately, I don't have anything more to add regarding the Permit file related to Closure Log # C-556, the Permit file for the Paint Shop (0210600007) or for site number 0210605081. If your FOIA search did not return the documents you are looking for, I don't know what to suggest.

Rob Watson, P.E.
RCRA Unit Manager
Permit Section, Bureau of Land
Illinois EPA
217.524.3265
Rob.Watson@illinois.gov
? Please consider the environment before printing this e-mail

-----Original Message-----
From: Joyce Munie <jmunie@andrews-eng.com>
Sent: Friday, October 23, 2020 11:09 AM
To: Watson, Rob <Rob.Watson@Illinois.gov>
Subject: [External] Checking on address

Rob,

I just want to make sure this is still the correct address.

Let me know, Joyce

Sinnott, Bill

From: Sanchez, Cynthia L.
Sent: Friday, April 9, 2021 8:52 AM
To: Sinnott, Bill; Herr, Alane
Cc: Pressnall, Chris
Subject: RE: rush EJ review?

Good morning Bill,

Chis and I both screened the address on EJ start, and it is not within an EJ area.

Liz Sanchez
Environmental Justice Intern
Illinois Environmental Protection Agency
M-Th 8:00am – 1:00pm

From: Sinnott, Bill <Bill.Sinnott@Illinois.gov>
Sent: Thursday, April 8, 2021 3:16 PM
To: Herr, Alane <Alane.Herr@Illinois.gov>
Cc: Sanchez, Cynthia L. <Cynthia.Sanchez@Illinois.gov>
Subject: RE: rush EJ review?

The facility's name is The Paint Shop or also known as Brandis Aircraft. It is located at 2207 S. Spresser St. in Taylorville, Il., Christian County. The LPC number is 0210600007. The consulting engineering company for the facility is Andrews Engineering located at 3300 Ginger Drive, Springfield Il, 62711. The facility is undergoing RCRA Closure of a hazardous waste container (S01) storage area and a hazardous waste treatment (T01) unit.

Thanks so much in advance.

Bill Sinnott
524-3310

From: Herr, Alane <Alane.Herr@Illinois.gov>
Sent: Thursday, April 8, 2021 3:08 PM
To: Sinnott, Bill <Bill.Sinnott@Illinois.gov>
Cc: Sanchez, Cynthia L. <Cynthia.Sanchez@Illinois.gov>
Subject: RE: rush EJ review?

Okay, sounds good. Sure, we can take the name and ID to start the process.

Thank you,
Alane

From: Sinnott, Bill <Bill.Sinnott@Illinois.gov>
Sent: Thursday, April 8, 2021 1:56 PM
To: Herr, Alane <Alane.Herr@Illinois.gov>
Cc: Sanchez, Cynthia L. <Cynthia.Sanchez@Illinois.gov>
Subject: RE: rush EJ review?

Good Afternoon Ladies. Thanks for the email. I am working from home and I am unable to access the EJ site. Could I possibly give you a name and state ID to start the process? Short of that I will be in the office tomorrow and can try then.

Thanks,

Bill

From: Herr, Alane <Alane.Herr@Illinois.gov>
Sent: Thursday, April 8, 2021 1:46 PM
To: Butler, Amy <Amy.Butler@Illinois.Gov>
Cc: Sinnott, Bill <Bill.Sinnott@Illinois.gov>; Sanchez, Cynthia L. <Cynthia.Sanchez@Illinois.gov>
Subject: RE: rush EJ review?

Hi there,

I'm out of office tomorrow but our intern Liz (who I've Cc'd) will be able to get it out for you ASAP. Just let us know which facility it is when you submit it. Thanks!

Best,
Alane

From: Butler, Amy <Amy.Butler@Illinois.Gov>
Sent: Thursday, April 8, 2021 11:46 AM
To: Herr, Alane <Alane.Herr@Illinois.gov>
Cc: Sinnott, Bill <Bill.Sinnott@Illinois.gov>
Subject: rush EJ review?

Hi,

My coworker Bill Sinnott reached out to me because he needs a rush on an EJ review if at all possible. I've copied him on this email so you can replay to him directly. If he can get it into the system later today, would you have time to look at it tomorrow? I worked with you previously so if you are no longer doing these please let us know.

Thanks!
Amy

Amy Butler
Geologist, Groundwater Unit
Illinois EPA/Bureau of Land/Permits
217/558-4716
Amy.Butler@illinois.gov

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MAB