Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

September 21, 1999

Mr. Ted Juracsik
Ted Juracsik Tool and Die
255 North Congress Avenue
Delray Beach, Florida 33445

Re: Facility No.: 090579

Dear Mr. Juracsik:

The Department has received the Title V General Permit Notification Form for the chromium electroplating and anodizing facility that you submitted on August 20, 1999.

Please note that in January of each year the Department will be mailing fee notices to those facilities using the Title V general permit. This annual operation fee is $50 and it is due and payable between January 15 and March 1 of each year the facility is in operation and is subject to the requirements of the Title V general permit.

If you have or expect to have any changes in your mailing address, location address, responsible official, or phone number, please notify the Department at the following address:

Title V General Permits Office
Bureau of Air Monitoring and Mobile Sources MS 5510
Department of Environemntal Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

If there are any changes in the facility status, including change of operating parameters or equipment, of if you have any additional questions regarding the Title V General Permit Program, please contact the District or local air program compliance inspector in your area.

Sincerely,

Sandra Bauman for Dotty Diltz, Chief
Bureau of Air Monitoring
and Mobile Sources

DD/jw

cc: Mr. Al Grasso, Palm Beach County

FLORIDA DEPARTMENT OF HEALTH

Jeb Bush, Governor | Robert G. Brooks, M.D , Secretary

(305) 820-0444

Certified Mail

August 17, 1999

RECEIVED

AUG 2 0 1999

Bureau of Air Monitoring & Mobile Sources

Mr. Nilesh Lakhlani
Project Geologist
Geo Tech Environmental
7488 NW 167 Terrace
Miami, FL 33152

Re: Application fir Title V Air General Permit

Dear Mr. Lakhlani:

The General Permit application for your project would be handled by the Department of Environmental Protection at Tallahassee. Accordingly, I am forwarding your application to Ms. Bowman. The Department will send you an invoice for the required fee. I am herewith returning your check and regret any inconvenience caused.

If you have any questions please call me at (561) 355-3136 xtn.1143.

Sincerely

Selva Selvendran, Engineer
Air Pollution Control Section

cc. Ms. Sandy Bowman
General Permits Section
Bureau of Air Monitoring and Mobile Sources
Department of Environmental protection
Mail Station 5510
2600 Blair Stone Road
Tallahassee, FL 32399-2400

CHROMIUM ELECTROPLATING AND ANODIZING
AIR GENERAL PERMIT NOTIFICATION FORM

Part III. Notification of Intent to Use General permit

Prior to filling out this form, please read the instructions provided at the end of the form. Send completed form to the address listed in the instructions and keep a copy of the form for your files.

Facility Name and Location

1. Facility Owner/Company Name (Name of corporation, agency, or individual owner):
   Ted Juracsik | Ted Juracsik Tool & Die (TJTD)
2. Site Name (For example, plant name or number):
   Ted Juracsik Tool & Die.
3. Hazardous Waste Generator Identification Number:
   Not known.
4. Facility Location:
   Street Address: 255 North Congress Avenue.
   City: Delray Beach County: Florida Zip Code: 33445.
5. Facility Identification Number (DEP Use ONLY - do not fill in): 0990579

Responsible Official

6. Name and Title of Responsible Official:
   Name: Ted Juracsik, Owner. Title: President.
7. Responsible Official Mailing Address:
   Organization/Firm: Ted Juracsik Tool & Die
   Street Address: 1201 N.W. 4th Avenue.
   City: Boca Raton County: Palm Bch. Zip Code: 33432.
8. Responsible Official Telephone Number:
   Telephone: (561) 391 - 0676 Fax: (561) 272 - 0047.

Facility Contact (If different from Responsible Official)

9. Name and Title of Facility Contact (For example, plant manager):
   Mr. Robert Brewer, General Manager.
10. Facility Contact Address:
    Street Address: 255 North Congress Avenue.
    City: Delray Bch County: Palm Bch County Zip Code: 33445.
11. Facility Contact Telephone Number:
    Telephone: (561) 272 - 0770 Fax: (561) 272 - 0047.

Facility Information

1.a. Provide the information below for each hard electroplating machine at the facility. Indicate the type of machine, the date of its purchase, and the date the control device was installed, if applicable.

HARD CHROMIUM PLATING TANKS

DATE PURCHASED	UNIT CLASS (circle one)	DATE CNTRL DEVICE INSTALLED	CONTROL DEVICE (see key)	APPLICABLE STANDARD (see key)
Anodizing	(New)/Existing	New.	PBS/CMP	B.
Tank #1.	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			

Key for Control Device Type

PBS = packed-bed scrubber
CMP = composite mesh pad
PBS/CMP = packed-bed scrubber and composite mesh pad
FS = fume suppressant only
FS/WA = fume suppressant with a wetting agent
FM = fiber-bed mist eliminator
WA = wetting agent

Applicable Standard Key

a = 0.03 mg/dscm
b = 0.015 mg/dscm
c = alternative standard for multiple tanks under common control

Is the facility's cumulative potential rectifier capacity greater than 60 million ampere-hours per year?

[ ] Yes [X] No

1.b. Provide the information below for each decorative electroplating or anodizing machine at the facility. Indicate the type of machine, the date of its purchase, and the date the control device was installed, if applicable.

DECORATIVE AND ANODIZING TANKS

DATE PURCHASED	UNIT CLASS (circle one)	DATE CNTRL DEVICE INSTALLED	CONTROL DEVICE (see key)	APPLICABLE STANDARD (see key)
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			

Key for Control Device Type

PBS = packed-bed scrubber
CMP = composite mesh pad
PBS/CMP = packed-bed scrubber and composite mesh pad
FS = fume suppressant only
FS/WA = fume suppressant with a wetting agent
FM = fiber-bed mist eliminator
WA = wetting agent

Applicable Standard Key

x = 0.01 mg/dscm
y = 45 dynes/cm
z = records of bath components (trivalent Cr tanks only)
c = alternative standard for multiple tanks under common control

2. Indicate the date by which the facility must meet the requirements of paragraph (5) of Part II:
(**Note:** if your facility contains both hard and decorative plating or anodizing units, you must check each applicable date)

[ ] January 25, 1996 [ ] January 25, 1997

3. Indicate how the facility will fulfill the compliance demonstration:

[X] The facility will conduct an initial performance test

[ ] The facility will use a wetting agent to reduce emissions and will meet the existing surface tension limit in No. 1 above.

4. Equipment Monitoring and Recordkeeping Information
Check all logs which are required to be kept on-site in accordance with the requirements of this general permit:

(a) Equipment maintenance	[x]	(b) Equipment inspection and repair	[x]
(c) Equipment malfunctions	[x]	(d) Operation and maintenance checklist	[ ]
(e) Instrument calibration (used during initial performance test)	[x]	(f) Start-up, shutdown, malfunction plan	[ ]
(g) Performance test results	[x]	(h) Equipment monitoring	[x]
(i) Excess emissions	[ ]	(j) Operating periods	[ ]
(k) Rectifier capacity	[ ]	(l) Fume suppressant records	[ ]
(m) Purchase records of wetting agent components	[ ]		

5. Surrender of Existing DEP Air Permit(s)

Please indicate with an "X" the appropriate selection:

[ ] I hereby surrender all existing DEP air permits authorizing operation of the facility indicated in this notification form; the permit number(s) are: _____.

[x] No DEP air permits currently exist for the operation of the facility indicated in this notification form.

CHROMIUM ELECTROPLATING AND ANODIZING
AIR GENERAL PERMIT NOTIFICATION FORM

Part III. Notification of Intent to Use General permit

Prior to filling out this form, please read the instructions provided at the end of the form. Send completed form to the address listed in the instructions and keep a copy of the form for your files.

Facility Name and Location

1. Facility Owner/Company Name (Name of corporation, agency, or individual owner): Ted Juracsik/Ted Juracsik Tool & Die (TJTD)
2. Site Name (For example, plant name or number): Ted Juracsik Tool & Die (TJTD)
3. Hazardous Waste Generator Identification Number: Not Known/TBA
4. Facility Location: Street Address: 225 N. Congress Avenue City: Delray Beach County: Palm Beach County Zip Code: 33445
5. Facility Identification Number (DEP Use ONLY - do not fill in):

Responsible Official

6. Name and Title of Responsible Official: Name: Mr. Ted Juracsik Title: Owner/President
7. Responsible Official Mailing Address: Organization/Firm: Ted Juracsik Tool & Die, Inc. Street Address: 1201 N.W. 4th Avenue City: Boca Raton County: Palm Beach Zip Code: 33432
8. Responsible Official Telephone Number: Telephone: (561) 391 -0676 Fax: (561) 272 -0047

Facility Contact (If different from Responsible Official)

9. Name and Title of Facility Contact (For example, plant manager): Mr. Robert Brewer, General Manager
10. Facility Contact Address: Street Address: 255 N. Congress Avenue City: Delray Beach County: Palm Beach Zip Code: 33445
11. Facility Contact Telephone Number: Telephone: (561)272 -0770 Fax: (561)272 -0047

Facility Information

1.a. Provide the information below for each hard electroplating machine at the facility. Indicate the type of machine, the date of its purchase, and the date the control device was installed, if applicable.

HARD CHROMIUM PLATING TANKS

DATE PURCHASED	UNIT CLASS (circle one)	DATE CNTRL DEVICE INSTALLED	CONTROL DEVICE (see key)	APPLICABLE STANDARD (see key)
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			

Key for Control Device Type

PBS = packed-bed scrubber
CMP = composite mesh pad
PBS/CMP = packed-bed scrubber and composite mesh pad
FS = fume suppressant only
FS/WA = fume suppressant with a wetting agent
FM = fiber-bed mist eliminator
WA = wetting agent

Applicable Standard Key

a = 0.03 mg/dscm
b = 0.015 mg/dscm
c = alternative standard for multiple tanks under common control

Is the facility's cumulative potential rectifier capacity greater than 60 million ampere-hours per year?

[____] Yes [_x_] No

1.b. Provide the information below for each decorative electroplating or anodizing machine at the facility. Indicate the type of machine, the date of its purchase, and the date the control device was installed, if applicable.

DECORATIVE AND ANODIZING TANKS

DATE PURCHASED	UNIT CLASS (circle one)	DATE CNTRL DEVICE INSTALLED	CONTROL DEVICE (see key)	APPLICABLE STANDARD (see key)
8/31/99	New	8/31/99	PBS/CMP	X
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			
	New/Existing			

Key for Control Device Type

PBS = packed-bed scrubber
CMP = composite mesh pad
PBS/CMP = packed-bed scrubber and composite mesh pad
FS = fume suppressant only
FS/WA = fume suppressant with a wetting agent
FM = fiber-bed mist eliminator
WA = wetting agent

Applicable Standard Key

x = 0.01 mg/dscm
y = 45 dynes/cm
z = records of bath components (trivalent Cr tanks only)
c = alternative standard for multiple tanks under common control

2. Indicate the date by which the facility must meet the requirements of paragraph (5) of Part II:
(**Note:** if your facility contains both hard and decorative plating or anodizing units, you must check each applicable date)

[____] January 25, 1996 [____] January 25, 1997

3. Indicate how the facility will fulfill the compliance demonstration:

[__x_] The facility will conduct an initial performance test

[____] The facility will use a wetting agent to reduce emissions and will meet the existing surface tension limit in No. 1 above.

4. Equipment Monitoring and Recordkeeping Information
Check all logs which are required to be kept on-site in accordance with the requirements of this general permit:

(a) Equipment maintenance	[__x_]	(b) Equipment inspection and repair	[_x__]
(c) Equipment malfunctions	[__x_]	(d) Operation and maintenance checklist	[_ x _]
(e) Instrument calibration (used during initial performance test)	[__x_]	(f) Start-up, shutdown, malfunction plan	[_x _]
(g) Performance test results	[__x_]	(h) Equipment monitoring	[_x _]
(i) Excess emissions	[__ _]	(j) Operating periods	[_x _]
(k) Rectifier capacity	[____]	(l) Fume suppressant records	[____]
(m) Purchase records of wetting agent components	[____]		

5. Surrender of Existing DEP Air Permit(s)

Please indicate with an "X" the appropriate selection:

[____] I hereby surrender all existing DEP air permits authorizing operation of the facility indicated in this notification form; the permit number(s) are:

_____.

[__x_] No DEP air permits currently exist for the operation of the facility indicated in this notification form.

Responsible Official Certification

I, the undersigned, am the responsible official, as defined in Part II of this form, of the facility addressed in this notification. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this not

ification are true, accurate and complete. Further, I agree to operate and maintain the air pollutant emissions units and air pollution control equipment described above so as to comply with all terms and conditions of this general permit as set forth in

Part II of this notification form. I will promptly notify the Department of any changes to the information contained in this notification. Print name of responsible official TED JURACSIK V.P.

Signature Date

11. **Facility Contact Telephone Number** - Enter the telephone number and facsimile number, if available, at which this person can be contacted.

Facility Information

1.a. If the hard chromium plating tank was initially purchased from the manufacturer on or before December 16, 1993, it is an **EXISTING** unit. If it was initially purchased from the manufacturer after December 16, 1993, it is a **NEW** unit. For each such tank located at the facility, enter the date the tank was purchased from the manufacturer in the dd-mm-yy format (for example, 01-JAN-95). If you do not know the exact date of purchase, but can verify that it was before December 16, 1993, enter 16-DEC-93. Indicate whether the unit is classified as new or existing. In column 3, enter the date the control device was installed on the tank in the dd-mm-yy format. In column 4, enter the type of control device associated with that tank, using the key for control devices located immediately below this table (for example, PBS for a packed-bed scrubber). In the far right column, enter the type of applicable emission limitation standard for that tank (for example, 0.03 mg/dscm), using the applicable standard key located immediately below this table. Complete the table for all tanks located at the facility. Up to ten hard chromium plating tanks may be entered across this table. If more than ten tanks are located on-site, submit additional copies of this page of the form as needed to characterize all equipment. Also, indicate with an "X" whether or not the facility's cumulative potential rectifier capacity exceeds 60 million ampere-hours per year.

1.b. If the decorative chromium plating or anodizing tank was initially purchased from the manufacturer on or before December 16, 1993, it is an **EXISTING** unit. If it was initially purchased from the manufacturer after December 16, 1993, it is a **NEW** unit. For each such tank located at your facility, enter the date the tank was purchased from the manufacturer in the dd-mm-yy format (e.g., 01-JAN-95). If you do not know the exact date of purchase, but can verify that it was before December 16, 1993, enter 16-DEC-93. Indicate whether the unit is classified as new or existing. In column 3, enter the date the control device was installed on the tank in the dd-mm-yy format. In column 4, enter the type of control device associated with that tank, using the key for control devices located immediately below this table (e.g., PBS for a packed-bed scrubber). In the far right column, enter the type of applicable emission limitation standard for that tank (e.g., 0.01 mg/dscm), using the applicable standard key located immediately below this table. Complete the table for all tanks located at the facility. Up to ten chromium decorative plating and/or anodizing tanks may be entered across this table. If more than ten tanks are located on-site, submit additional copies of this page of the form as needed to characterize all equipment.

2. Based upon the information provided in Part II of this notification form, indicate with an "X" the date by which the facility must meet the emission control requirements.

3. Indicate with an "X" how the facility will fulfill the compliance demonstration required by this permit.

Equipment Monitoring and Recordkeeping Information

6. Indicate all logs which are required to be kept on-site in accordance with the requirements of this notification form with an "X".

Surrender of Existing DEP Air Permit(s)

7. Rule 62-213.300(2)(a)2., F.A.C., makes the surrender of all existing DEP air permits authorizing the operation of a facility a condition precedent for the entitlement to a general permit. Indicate whether the responsible official surrenders such permit(s), listing the permit numbers, or whether no such permit(s) exist with an "X".

Responsible Official Certification

This statement must be both printed and signed by the person named on page 19, Field 6, of this form.

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

August 25, 1999

Mr. Robert Brewer, General Manager
Ted Juracsik Tool & Die
255 North Congress Avenue
Delray Beach, Florida 33432

Dear Mr. Brewer:

Upon review of your Chromium Electroplating and Anodizing air general permit notification form received on August 20, I found certain items incorrect or omitted altogether. In accordance with the terms and conditions set forth in Rule 62-213.300, F.A.C., this information must be accurate and complete. Please correct these items and submit the completed form to the department as soon as possible. Corrections should be made on DEP Form Number 62-213.900(5) with an effective date of February 24, 1999 (copy attached). The following is a list of items to correct:

- On Page 21, 1.a., add actual date or projected date of control device installation.
- On Page 22, 4, items (d), (f), (i), and (j) are required for a hard chromium plating facility. Place a mark in the corresponding space for each item.
- Page 23 has been omitted. The person listed as the Responsible Official should sign the Responsible Official Certification.

Please contact me at 850/921-9586 with any questions.

Sincerely,

Rick Butler Sandra Bowman
Mobile Source Control Section
Bureau of Air Monitoring
and Mobile Sources

RB/

Enclosures

Department of
Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

August ~~31~~ 25, 1999

Mr. Robert Brewer, General Manager
Ted Juracsik Tool & Die
255 North Congress Avenue
Delray Beach, Florida 33432

Dear Mr. Brewer:

Upon review of your Chromium Electroplating and Anodizing air general permit notification form received on August 20, I found certain items incorrect or omitted altogether. In accordance with the terms and conditions set forth in Rule 62-213.300, F.A.C., this information must be accurate and complete. Please correct these items and submit the completed form to the department as soon as possible. Corrections should be made on DEP Form Number 62-213.900(5) with an effective date of February 24, 1999 (copy attached). The following is a list of items to correct:

- On Page 21, 1.a., add actual date or projected date of control device installation.
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- Page 23 has been omitted. The person listed as the Responsible Official should sign the Responsible Official Certification.

Please contact me at 850/921-9586 with any questions.

Sincerely,

original signed

Rick Butler
Mobile Source Control Section
Bureau of Air Monitoring
and Mobile Sources

RB/

Enclosures

GEOTECH ENVIRONMENTAL, INC.
14630 Bull Run Road • Suite 114 • Miami Lakes, Florida 33014
P.O. Box 520641 • Miami, Florida 33152 • Tel (305) 820-1377 • Fax (305) 820-3229

GEO·TECH
ENVIRONMENTAL

August 11, 1999
Project No. 029901

Mr. Selva Selvendran, Engineer
State of Florida Palm Beach County Health Department (PBHD)
Air Pollution Control Section
Division of Environmental Health and Engineering
901 Evernia Street
P.O. Box 29
West Palm Beach, FL 33402-0029

Subject: Industrial Waste Pretreatment Application (IWP) for Ted Jurascik Tool & Die Company (TJTD) located at 255 North Congress Avenue, Delray Beach, Palm Beach County, Florida.

Dear Mr. Selvendran:

This cover letter, application, engineering drawings and appendices constitute a Title V Operating permit application for the TJTD facility located at the subject site.

TJTD is principally engaged in the manufacturing of fly fishing reels, CNC machining, EDM machining, metal stamping, fixtures & jigs, and special machines for commercial customers. Such operations involve aluminum anodizing of parts, which are currently sent offsite for electroplating. TJTD has chosen to engage in in-house anodizing operations and therefore, requests air permit approval pursuant to the applicability criteria of FDEP Rule 62-213.300(1), F.A.C., set forth in Part II, section (1), FDEP notification form. Based on the procedures described in section (5) of the FDEP notification form, GeoTech Environmental, Inc. (GeoTech) has determined that the subject site's annual emissions of chromium do not exceed 10 tons per year. Therefore, a completed Part III Chromium Electroplating and Anodizing Air General Permit Notification form (FDEP form No. 62-213.900(5)) is included in **Attachment A** for your review and approval.

TJTD proposes to install a Vanaire HF, packed bed scrubber to remove water soluble contaminants by means of gas absorption or mechanical impingement (see **Attachment B** and engineering drawings). In addition, Vanaire has provided most recent test data on the scrubber, confirming the scrubbers high efficiency rates and indicating that the scrubber meets the allowable emission rate of 0.015 mg/DSCM. TJTD also will conduct a performance test using the test methods and procedures specified in Appendix A of 40 CFR Part 63. The performance test results shall be documented in complete test reports that contain the information required by that section and submitted to PBHD within 90 days following completion of the test. A check in the amount of $ 100.00 is included as review fee.

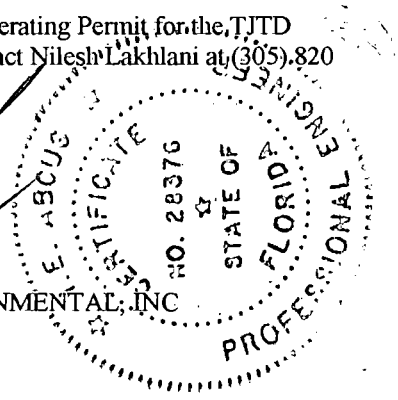
Mailing Address: P.O. Box 520641, Miami, Florida 33152 • Location: 7488 N.W. 167th Terrace, Miami, FL 33015
Tel: (305) 820 0444 Fax: (305) 820 1244 Internet: http:www/bridge.net/ ~ geotech E-Mail: GeoTech@bridge.net.

We look forward to working with PBHD in the development of the Title V General Operating Permit for the TJTD facility. If you have any questions or comments regarding this application, please contact Nilesh Lakhlani at (305) 820 0444.

Very truly yours,

Nilesh Lakhlani
Project Geologist

Irving E. Abcug, P.E.
Project Engineer
GEOTECH ENVIRONMENTAL, INC



Enclosures--

pc. Mr. Robert Brewer, Plant Manager, TJTD

Equipment Monitoring and Recordkeeping Information

Check all logs which are required to be kept on-site in accordance with the requirements of this general permit:

(a) Equipment maintenance	[_x_]	(b) Equipment inspection and repair	[_x_]
(c) Equipment malfunctions	[_x_]	(d) Operation and maintenance checklist	[_ _]
(e) Instrument calibration	[_x_]	(f) Start-up, shutdown, malfunction plan	[____]
(g) Performance test results	[_x_]	(h) Equipment monitoring	[_x_]
(i) Excess emissions	[____]	(j) Operating periods	[____]
(k) Rectifier capacity	[____]	(l) Fume suppressant records	[____]

(m) Purchase records of wetting agent components [____]

Surrender of Existing Air Permit(s)

Please indicate with an "X" the appropriate selection:

[____] I hereby surrender all existing air permits authorizing operation of the facility indicated in this notification form; specifically, permit number(s) _____.

[_x_] No air permits currently exist for the operation of the facility indicated in this notification form.

Responsible Official Certification

I, the undersigned, am the responsible official, as defined in Part II of this form, of the facility addressed in this notification. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this notification are true, accurate and complete. Further, I agree to operate and maintain the air pollutant emissions units and air pollution control equipment described above so as to comply with all terms and conditions of this general permit as set forth in Part II of this notification form.

I will promptly notify the Department of any changes to the information contained in this notification.

Robert T. Brown — Signature

5/21/99 — Date

ATTACHMENT A

Chromium Anodizing Facilities Notification Form

Chromium Electroplating and Anodizing Facilities Notification

Facility Name and Location

1. Facility Owner/Company Name (Name of corporation, agency, or individual owner):

   Ted Juracsik/Ted Juracsik Tool & Die (TJTD)

2. Site Name (For example, plant name or number):

   Ted Juracsik Tool & Die (TJTD)

3. Hazardous Waste Generator Identification Number:

   Not Known/TBA

4. Facility Location:
   Street Address: 255 North Congress Avenue
   City: Delray Beach County: Palm Beach County Zip Code: 33445

5. Facility Identification Number (DEP Use):

Responsible Official

6. Name and Title of Responsible Official:

   Mr. Ted Juracsik, Owner/President

7. Responsible Official Mailing Address:

   Organization/Firm: Ted Juracsik Tool & Die (TJTD)
   Street Address: 1201 N.W. 4th Avenue
   City: Boca Raton County: Palm Beach County Zip Code: 33432

8. Responsible Official Telephone Number:
   Telephone: (561) 391-0676 Fax: (561) 272-0047

Facility Contact (If different from Responsible Official)

9. Name and Title of Facility Contact (For example, plant manager):

   Mr. Robert Brewer, General Manager

10. Facility Contact Address:

    Street Address: 255 North Congress Avenue
    City: Delray Beach County: Palm Beach County Zip Code: 33445

11. Facility Contact Telephone Number:		
Telephone: (561)272-0440		Fax: (561) 272-0047

Facility Information

1.a. Provide the information below for each hard electroplating machine at the facility. Indicate the type of machine, the date of its purchase, and the date the control device was installed, if applicable.

	HARD	CHROMIUM	PLATING	TANKS
TANK ID #	DATE PURCHASED	DATE CNTRL DEVICE INSTALLED	CONTROL DEVICE (see key)	APPLICABLE STANDARD (see key)
Anodizing tank # 11	New*	New	PBS/CMP	B

New* - The Anodizing tank and the control device is to be purchased and installed in May 1999.

Key for Control Device Type

PBS = packed-bed scrubber
CMP = composite mesh pad
PBS/CMP = packed-bed scrubber and composite mesh pad
FS = fume suppressant only
FS/WA = fume suppressant with a wetting agent
FM = fiber-bed mist eliminator

Applicable Standard Key

a = 0.03 mg/dscm
b = 0.015 mg/dscm
c = alternative standard for multiple tanks under common control

Is the facility's cumulative potential rectifier capacity greater than 60 million ampere-hours per year?

[____] Yes [__x__] No

Were any hard chromium plating tanks at the facility operating before 12/16/93?

[____] Yes [__x__] No

1.b. Provide the information below for each decorative electroplating or anodizing machine at the facility. Indicate the type of machine, the date of its purchase, and the date the control device was installed, if applicable.

	DECORATIVE	AND	ANODIZING	TANKS
TANK ID #	DATE PURCHASED	DATE CNTRL DEVICE INSTALLED	CONTROL DEVICE (see key)	APPLICABLE STANDARD (see key)

Key for Control Device Type

PBS = packed-bed scrubber
CMP = composite mesh pad
PBS/CMP = packed-bed scrubber and composite mesh pad
FS = fume suppressant only
FS/WA = fume suppressant with a wetting agent
FM = fiber-bed mist eliminator

Applicable Standard Key

x = 0.01 mg/dscm
y = 45 dynes/cm
z = records of bath components (trivalent Cr tanks only)
c = alternative standard for multiple tanks under common control

2. Indicate the date by which the facility must meet the requirements of section (5) of Part II of this form:

[____] January 25, 1996 [____] January 25, 1997

3. Indicate how the facility will fulfill the compliance demonstration:

[_ x_] The facility will conduct an initial performance test

[____] The facility will use a wetting agent to reduce emissions and will meet the existing surface tension limit in No. 3 above.

ATTACHMENT B

Scrubber Test Data

CHROMIUM EMISSION TEST
HALE CHROME
2282 ALBION STREET
TOLEDO, OHIO 43600

TEST PERFORMED BY:

VANAIRE DIVISION
VANEGAS ENTERPRISES
10151 BUNSEN WAY
LOUISVILLE, KY 40299

SEPTEMBER 28, 1998

OCTOBER 22, 1998

HALE CHROME
2282 ALBION STREET
TOLEDO,OHIO 43600

ATTN: RICK DEYE

SUBJECT: TEST REPORT

Dear Mr. DEYE:

Please find enclosed the test report for your chrome emissions test on the 18000 CFM Exhaust System.

Should you have any questions or require additional information, please contact me.

Sincerely,

Jim Bullen
Project Manager

Enclosures

CERTIFICATION

This is to certify that the test data was gathered and recorded in accordance with the requirements of Method 306A as outlined in the Federal Register 40CFR 63.344

DAVID BURCHAM
Test Technician

This is to certify that this report is authentic and accurate with all sample evaluations and calculations in accordance with 40 CFR 63.344

JAMES R. BULLEN, JR.
Project Manager
Vmaire

This is to certify that I have examined this report and find it to be accurate and authentic with all sample evaluations and calculations in accordance with 40CFR 63.344

G.J. VANEGAS P.E.
President
Vanegas Enterprises

TABLE OF CONTENTS

INTRODUCTION

PLANT OWNER: HALE CHROME

PURPOSE: TO DETERMINE EMISSION OF CHROME FROM THE 1500 CFM CHROME PLATING SYSTEM

TESTED BY:

DAVID BURCHAM - TECHNICIAN

PREPARED BY:

JAMES R. BULLEN, JR.
PROJECT MANAGER-VANAIRE

DATE TESTED: 9/28/98

POLLUTANTS: TOTAL CHROME

TEST WITNESSED BY:

_____

HALE CHROME, INC.

SUMMARY OF TEST RESULTS

Emission Test Results:

Run #1	<	**0.00214mg/DSCM**
Run #2	<	**0.00493mg/DSCM**
Run #3	<	**0.00557mg/DSCM**
Average	<	**0.00421mg/DSCM**

Allowable Emission Rate 0.015mg/DSCM

Operating Level - The chrome plating tanks were operated at or above normal operating conditions and approaching maximum capacity during entire test. See page 3 (Facility Operation During Testing) for details.

Samples collected were stored and transported to Louisville Testing Laboratory Inc. in an ice bath to maintain a temperature of 40° F.

FACILITY OPERATION DURING TESTING

This system tested consisted of five (5) hard chrome plating tank that is vented through PVC Hoods and duct. The exhaust duct then goes into a pre-controller. The gas then passes into a three (3) stage Vanaire composite mesh pad scrubber. A fan immediately following the Chromax exhausts the clean air into the atmosphere.

SAMPLING
AND ANALYTICAL PROCEDURES

Sample Collection:

Samples were collected from the fan outlet duct (See Appendix I). The point locations are 90° apart in the 34" diameter duct.

Sampling Method:

Method 306A (40CFR 63) was used for the sample collection. A full description of the sampling train, schematic drawing of the sample train, and sample collection procedure is contained in Appendix III. The field data sheets and calculations are contained in Appendix IV.

Sample Analysis

The samples collected were analyzed by:

Environmental Consultants, Inc.
391 Newman Ave.
Clarksville, IN 47129

The analysis results and methods used are contained in Appendix V.

APPENDIX I

DRAWINGS
97-5587-1
97-5587-2
97-5587-6

APPENDIX II

OPERATING CONDITIONS

OPERATING CONDITIONS

The chrome plating bath was operated at or above normal operating conditions during the entire test.

The samples collected were stored and transported to Environmental Consultants Inc. in Clarksville, IN in an ice bath to maintain a temperature of 40° F.

II. Process Description

The testing was performed on the discharge from five hard Chrome plating tanks which discharge to a common scrubber and stack. A Vanaire 18000 cfm Chromax three stage scrubber with pre-controller is used for emission control.

(1)

TANK	(10) A	(10) B	(11)	(12) A	(12) B
TIME					
1:04 PM	1500	1800	1700	1600	1600
1:19 PM	1600	1800	1700	1600	1600
1:34 PM	1600	1800	1700	1600	1600
1:49 PM	1600	1800	1900	0	1600
2:04 PM	1650	1800	1850	0	1600
2:19 PM	1650	1800	1850	1500	1600
2:34 PM	1650	1800	1850	1500	1600
2:49 PM	1650	1800	1850	1500	1600
3:04 PM	1650	1800	1800	1500	1600

(2)

2:43 PM	1700	1800	1850	850	1600
2:58 PM	1700	1800	1850	900	1600
3:13 PM	1700	1800	1400	900	1600
3:28 PM	1700	1800	1500	900	1600
3:43 PM	1700	1800	1550	950	1600
3:58 PM	1700	1800	1550	950	1600
4:13 PM	1700	1800	1550	950	1600
4:28 PM	1700	1800	1550	950	1600
4:43 PM	1700	1800	1550	950	1600

Tank	(13) - A	B	(14) - A	B	over All
Time					
12:04 PM	1600	1600	1300	1600	4.4
12:19 PM	1600	1600	1300	900	4.4
12:34 PM	1600	1600	1300	950	4.2
12:49 PM	1600	1650	1300	950	4.2
1:04 PM	1600	1650	1300	950	4.2
1:19 PM	1650	500	1350	1000	4.2
1:34 PM	1650	500	1350	1000	4.2
1:49 PM	1650	550	1350	0	4.2
2:04 PM	1650	550	1350	0	4.2
[redacted]					
(2)					
2:43 PM	1700	750	1400	1600	4.2
2:58 PM	1650	850	1400	1600	4.2
3:13 PM	1650	900	1400	1600	4.2
3:28 PM	1650	900	1400	1600	4.2
3:43 PM	1600	950	1400	1600	4.2
3:58 PM	1650	950	1400	1600	4.2
4:13 PM	1650	950	1400	1600	4.2
4:28 PM	1650	950	1400	1600	4.2
4:43 PM	1650	950	1400	1600	4.2

F - (13)

TANK	(10) - A	- B	(11)	(12) - A	- B
TIME					
1:10 PM	1700	1800	1600	950	1600
1:25 PM	1700	1800	1600	950	1600
1:40 PM	1700	1800	1600	950	1600
1:55 PM	1700	1800	1600	950	1600
2:10 PM	1700	1800	1600	950	1600
2:25 PM	1700	1800	1600	950	1600
2:40 PM	1700	1800	1600	950	1600
2:55 PM	1700	1800	1600	950	1600
3:10 PM	1700	1800	1600	950	1600
3:25 PM					

TANK	(13) A -	B	(14)	A -	B	OVER ALL
5:10	1650	1000		1400	1600	4.2
5:25	1650	1000		1400	1600	4.2
5:40	1650	1000		1400	1600	4.2
5:55	1650	1000		1400	1600	4.4
6:10	1650	1000		1400	1600	4.2
6:25	1650	1000		1400	1600	4.2
6:40	1650	1000		1400	1600	4.2
6:55	1650	1000		1400	1600	4.2
7:10	1650	1000		1400	1600	4.2

APPENDIX III

CHROMIUM EMISSION TEST PROCEDURE METHOD 306A

VANAIRE LTD
10151 BUNSEN WAY
LOUISVILLE, KY. 40299
(502) 491-3553

Technical Bulletin

NUMBER 306A
REVISION 1
DATE 4/12/96
PAGE 1 OF

APPENDIX I

CHROMIUM EMISSION TEST PROCEDURE METHOD 306A

Applicable to the measurement of Chromium (Cr) in emission from Hard Chrome electroplating, decorative Chrome Electroplates, and Chrome Anodizing.

Your Vanaire Model 306A Sampling train will extract a sample of the air stream at a constant rate determined by a critical orifice. The sample is collected in an impinger (Mason Jar) which is subsequently sent to a laboratory for quantitative analysis of the chromium content.

The concentration of Chromium will be determined by any of the following analytical methods:

ICAE - Inductively coupled plasma emission spectrometry

GFAAS - Graphite furnace atomic absorption spectrometry

IC/PCR - Ion chromatography with a post-column reactor

SAMPLING TRAIN

A schematic of the sampling train is shown in Figure 306A-1. All necessary components, except chemicals are included in your Vanaire 306A Unit.

IMPINGERS

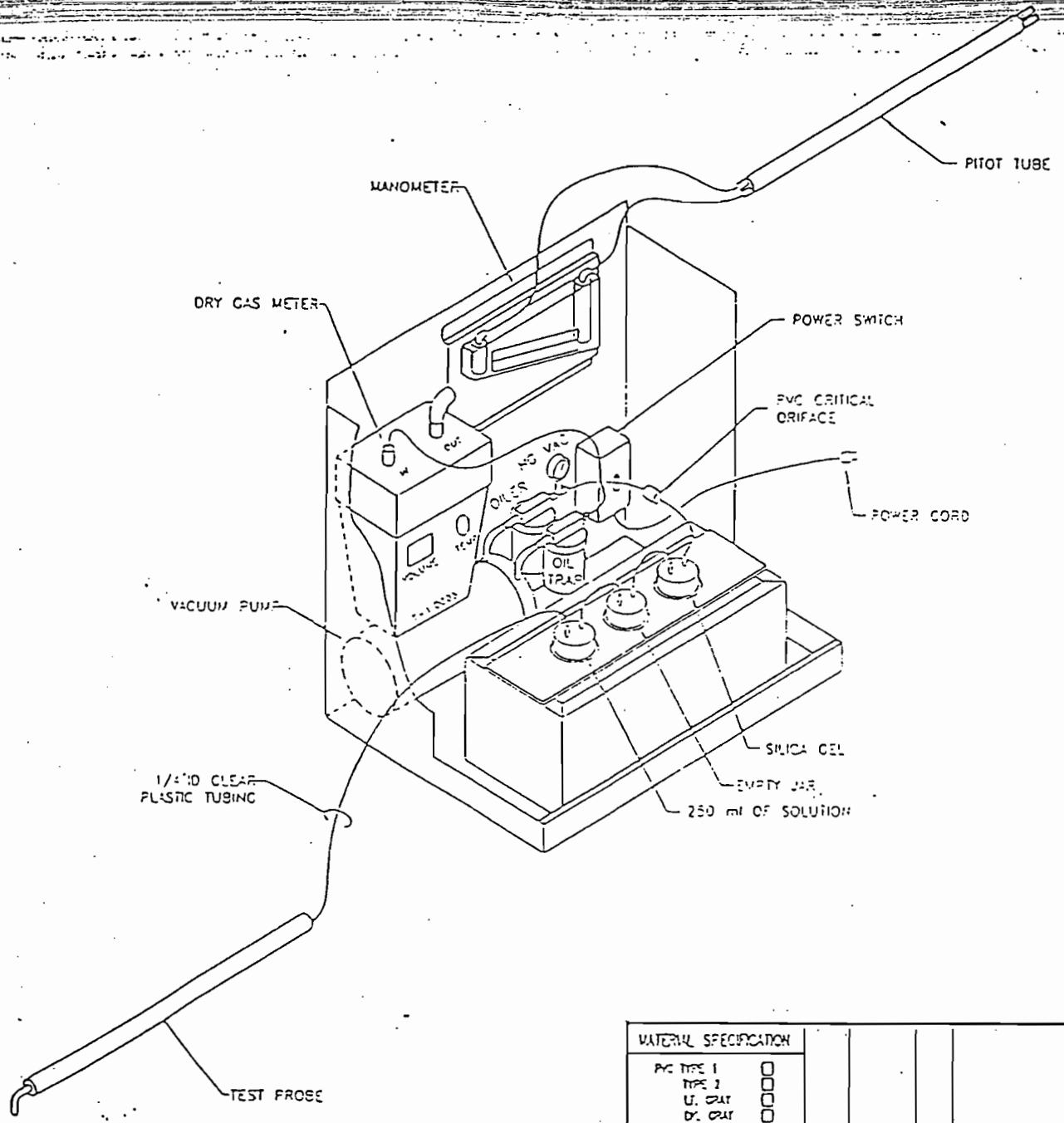
One quart capacity "Mason" glass canning jars with vacuum seal lids are used. Three impingers are required: the first is for collecting the absorbing solution, the second is empty and is used to collect any absorbing solution carried over from the first impinger, and the third contains the drying agent.

MANOMETER

Inclined/vertical type, as described in Section 2.2 of Method 2 (40 CFR Part 60, Appendix A).

CRITICAL ORIFICE

The critical orifice is a small restriction in the sample line (approximately 1/16 inch in diameter) that is located upstream of the vacuum pump and sets the sample rate at about 0.75 cfm.



MATERIAL SPECIFICATION

PVC TYPE 1 ☐
TYPE 2 ☐
U. GRAY ☐
DK. GRAY ☐
WHITE ☐
CPVC ☐
P/P NATURAL ☐
BLACK ☐
WHITE ☐

YANAIRE
10151 BUNSEN WAY
LOUISVILLE, KY. 40299
(502) 491-3553 (502) 491-5122 (FAX)

TITLE

306-A SAMPLING TRAIN

BY	DATE	CUSTOMER
CJ	4/22/98	

NO.	DATE	BY	REVISIONS	APPROVED	DATE	P.O.	REV.

SCALE: 1" = [illegible] TRAIN

APPENDIX I

PUMP OILER

A glass oil reservoir with a wick mounted at the vacuum pump inlet lubricates the pump vanes. The oiler is an in line type and not vented to the atmosphere.

VACUUM PUMP

Gast Model 0522-V103-G18DX is capable of delivery at least 1.5 cfm at 15 in. Hg vacuum.

OIL TRAP

An empty glass oil reservoir without wick is mounted at pump outlet to prevent oil from reaching the dry gas meter.

DRY GAS METER

A Rockwell Model 175-S test meter, with a thermometer installed to monitor meter temperature. The dry gas meter is capable of measuring volume to within 2%.

SAMPLE RECOVERY

Wash Bottles. These are glass or inert plastic, 500 or 1000 ml, with spray tube.

REAGENTS

Sampling

Water. Reagent water that conforms to ASTM Specification D1193-77, Type II (incorporated by reference - see § 61.14). It is recommended that water blanks be checked prior to preparing sampling reagents to ensure that the Cl^- content is less than the analytical detection limit.

Sodium Hydroxide (NaOH) Absorbing Solution. 0.1 N or Sodium Bicarbonate ($NaHCO_3$) Absorbing Solution, 0.1 N. Dissolve 4.0 g of sodium hydroxide in 1) of water, or dissolve 8.5 g of sodium bicarbonate in 1) of water.

Sample Recovery

0.1 N NaOH or 0.1 N $NaHCO_3$. Use the same solution for recovery as was used in the impingers.

Velocity Pressure Traverse

Perform a velocity pressure traverse before the first sample run. Figure 306A-2 may be used to record velocity pressure data. If testing occurs over several days, perform the traverse at the beginning of each day. Perform velocity pressure traverses as specified in Section 3 of Method 2, but record only the Δp (velocity head) values for each sampling point.

Check for cyclonic flow during the first traverse to verify that it does not exist; if cyclonic flow does exist, make sure that the absolute average angle of misalignment does not exceed 20 degrees. If the average angle of misalignment exceeds 20 degrees at an outlet location, install straightening vanes to eliminate the cyclonic flow. If it is necessary to test an inlet location where cyclonic flow exists, it may not be possible to install straightening vanes. In this case, a variation of the alignment method must be used. This must be approved by the Administrator.

Point Sampling Times

Because the sampling rate of the train is held constant by the critical orifice, it is necessary to calculate specific sampling times for each point in order to obtain a proportional sample. If all sampling can be completed in a single day, it is necessary to calculate the point sampling times only once. If sampling occurs over several days, recalculate the point sample times each day using velocity traverse data obtained earlier in the day. Determine the average of the Δp values obtained during the velocity traverse (Figure 306A-2). Calculate the sampling times for each point using Equation 306A-1. Convert the decimal parts of minutes to seconds. If the stack diameter is less than 12 inches, use 7.5 minutes in place of 5 minutes in the equation and 16 sampling points.

$$\text{Minutes at point } n = \sqrt{\frac{\text{Point } n\ \Delta p}{(\sqrt{\Delta p})\ \text{avg.}}} \times 5 \text{ minutes} \quad \text{Eq. 306A-1}$$

Where:

n = Sampling point number.

Δp = Velocity head measured by Type-S pitot tube, in. H_2O

Preparation of Sampling Train

Assemble the sampling train as shown in Figure 306A-1. Before charging, rinse the first mason jar impinger with either 0.1 N sodium hydroxide (NaOH) or 0.1 N sodium bicarbonate ($NaHCO_3$); discard the solution. Put 250 ml of 0.1 N NaOH or 0.1 N $NaHCO_3$ absorbing solution into the first mason jar impinger. Similarly, rinse the second mason jar impinger and leave empty. Put silica gel into the third mason jar impinger until the impinger is about full. Place the impingers into an ice bath and check to ensure that the lids are tight.

Train Leak Check Procedure

Wait until the ice has cooled the impingers before sampling. Next, seal the nozzle with a finger covered by a piece of clear plastic wrap and turn on the pump. The vacuum in the line between the pump and the critical orifice must be at least 15 in. Hg. Observe any leak rate on the dry gas meter. The leak rate should not exceed 0.02 cfm.

Figure 306A-2: Velocity Traverse and Point Sample Time Calculation Sheet

Plant _____
Date _____ Time _____
Location _____
Operator(s) _____
Beginning stack temperature, °F _____
Ending stack temperature, °F _____
Average stack temperature, °F _____

Circle one:

Before Run 1 Before Run 2 Before Run 3 After Run No.

Schematic of Points

Traverse Point Number	Cyclonic Flow Angle (Degrees)	Δp	$\sqrt{\Delta p}$	$\frac{\sqrt{\Delta p}}{(\sqrt{\Delta p})_{avg}}$ x 5 min = Numerical Minutes	Decimal Part of Minute x 60 = Seconds	Whole Minutes + Seconds = Sample Time

	Avg		Avg			

Sampling Train Operation

Record all pertinent process and sampling data on the data sheet (see Figure 306A-3). Ensure that the process operation is suitable for sample collection.

Place the probe/nozzle into the duct at the first sampling point and turn on the pump. A minimum vacuum of 15 in. Hg or 0.47 atmosphere between the critical orifice and pump is required to maintain critical flow. Sample for the time interval previously determined for that point. Move to the second point and sample for the time interval determined for that point; sample all points on the traverse in this manner. Keep ice around the impingers during the run. Complete the traverse and turn off the pump. Move to the next sampling port and repeat. Record the final dry gas meter reading. (NOTE: If an approximate mass emission rate is desired, record the stack temperature before and after the run.)

Post Test Leak Check

Remove the probe assembly and flexible tubing from the first impinger. Do not cover the nozzle. Seal the inlet tube of the first impinger with a finger covered by clear plastic wrap and turn on the pump. The vacuum in the line between the pump and the critical orifice must be at least 15 in. Hg. Observe any leak rate on the dry gas meter. If the leak rate exceeds 0.02 cfm, reject the run. If the leak rate is acceptable, take the probe assembly and impinger assembly to the sample recovery area.

Sample Recovery

Container No. 1. After the train has been moved to the sample recovery area, disconnect the tubing that joins the first impinger with the second.

The first impinger jar is also used as the sample container jar. Unscrew the lid from the first impinger jar. Lift the inlet/outlet tube assembly almost out of the jar, and using the wash bottle, rinse the outside of the impinger tip that was immersed in the impinger jar with extra absorbing solution; rinse the inside of the tip as well.

Recover the second impinger by removing the lid and pouring any contents from the second impinger into the first impinger. Rinse the second impinger including the inside and outside of the impinger stem as well as any connecting plastic tubing with extra absorbing solution and place the rinse into the first impinger.

Hold the nozzle and connecting plastic tubing in a vertical position so that the tubing forms a "U". Using the wash bottle, partially fill the tubing with sampling reagent. Raise and lower the end of the plastic tubing several times to cause the reagent to contact the major portion of the internal parts of the assembly thoroughly. Do not raise the solution level too high or part of the sample will be lost. Place the nozzle end of the assembly over the mouth of the first impinger jar (sample container) and elevate the plastic tubing so that the solution flows rapidly out of the nozzle. Perform this procedure three times. Next, repeat the recovery procedure but allow the solution to flow rapidly out the open end of the plastic tubing into the first impinger jar.

Place a piece of clear plastic wrap over the mouth of the first impinger jar. Use a standard lid and band assembly to seal the jar. Label the jar with the sample number and mark the liquid level to gauge any losses during handling.

Container No. 2 (Reagent Blank)

Place approximately 500 ml of the 0.1 N NaOH or 0.1 N $NaHCO_3$ absorbing solution in a labeled sample container.

Figure 306A-3. Chromium Constant Sampling Rate Field Data Sheet

n _____ Date _____ Run Number _____

mpling Site _____ Operator _____

al Cr catch, M_{cr}, µg _____ Stack Radius, r, in. _____

vg ry gas meter temp, T_m, °F _____ Avg sq. rt. Δp, $(\sqrt{\Delta p})_{avg}$, in. H_2O _____

ter correction factor, Y_m _____ Stack temp, T_s, °F _____

t volume, V_m, ft^3 _____ Leak rate before run, cfm _____

ar etric press, P_{bar}, in. Hg _____ Leak rate after run, cfm _____

rt clock time _____ Stop meter volume, ft^3 _____

lock time _____ Start meter volume, ft^3 _____

MARKS: _____

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)

$$= \frac{(M_{cr})(T_m + 460)}{(499.8)(Y_m)(V_m)(P_{bar})}$$

$$\text{kg/hr} = (C_{cr})(0.0001597)(r^2)(\sqrt{\Delta p})_{avg}\sqrt{\frac{(T_s + 460)}{(P_{bar})(28.73)}}$$

/cubic meter, (C_{cr}) _____ (Optional) kg/hr _____

Figure 306A-3. Chromium Constant Sampling Rate Field Data Sheet

[redacted] _____ Date _____ Run Number _____

ampling Site _____ Operator _____

[redacted] Cr catch, M_{cr}, µg _____ Stack Radius, r, in. _____

Vg[redacted]ry gas meter temp, T_m, °F _____ Avg sq. rt. Δp, $(\sqrt{\Delta p})_{avg}$, in. H_2O _____

[redacted]eter correction factor, Y_m _____ Stack temp, T_s, °F _____

[redacted] volume, V_m, ft^3 _____ Leak rate before run, cfm _____

ar[redacted]metric press, P_{bar}, in. Hg _____ Leak rate after run, cfm _____

[redacted]rt clock time _____ Stop meter volume, ft^3 _____

[redacted]clock time _____ Start meter volume, ft^3 _____

[redacted]MARKS: _____

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)

$$C_{cr} = \frac{(M_{cr})(T_m + 460)}{(499.8)(Y_m)(V_m)(P_{bar})}$$

$$\text{kg/hr} = (C_{cr})(0.0001597)(r^2)(\sqrt{\Delta p})_{avg}\sqrt{\frac{(T_s + 460)}{(P_{bar})(28.73)}}$$

[redacted]/cubic meter, (C_{cr}) _____ (Optional) kg/hr _____

Sample Filtration for IC/PCR

If the sample is to be analyzed for Cr^{+6} by IC/PCR, it must be filtered immediately following recovery as described in Section 5.2.3 of Method 306.

Analysis

Sample preparation and analysis procedures are identical to Method 306, Section 5.3.

CALIBRATION

Dry Gas Meter

Dry gas meter calibrations may be performed by either the manufacturer, a firm who provides calibration services, or the tester. The dry gas meter calibration coefficient (Y_m) must be determined prior to initial use of the meter, and must be checked following each field use.

If the dry gas meter is new, the manufacturer will have specified the Y_m for the meter. The manufacturer may also have included a calibration orifice and a data sheet with the meter that may be used for calibration purposes. The sheet will specify a standard cubic foot volume and a sample time, and these values were determined when the orifice was used to set the initial Y_m for the meter. The Y_m may be checked by disconnecting the critical orifice in the sampling train and replacing it with the calibration orifice. The inlet side of the calibration orifice is open to the atmosphere and is not reconnected to the sample train. Record the initial dry gas meter volume and meter temperature. Turn on the pump and operate it for the number of minutes specified by the manufacturer's data sheet. Stop the pump and record the final dry gas meter volume and temperature. Subtract the start volume from the stop volume and average the temperatures. Check the Y_m for the dry gas meter after the test by using the following equation:

$$Y = \frac{Ft.^3_m (T_m - 460)}{17.647 (Ft^3_{pt}) (P_{bar})}$$

Where:

$Ft.^3_m$ = Cubic feet given by meter manufacturer

T_m = Temperature of meter in degrees Fahrenheit

Ft^3_{pt} = Cubic feet from dry gas meter, post test

P_{bar} = Barometric pressure in inches of mercury

Compare the Y_m just calculated with the Y_m given by the manufacturer:

$$\frac{Y_m \text{ (manufacturer)}}{Y_m \text{ (calculated after test)}}$$

If this value is between 0.95 and 1.05, the Y_m of the meter is acceptable. If the value lies outside the specified range, the test series shall either be voided, or calculations for the test series shall be performed using whichever meter coefficient value (i.e., before and after) that gives the lower value of total sample volume. Return the dry gas meter to the manufacturer for recalibration.

The calibration may also be conducted as specified in Section 5.3.1 or Section 7 of Method 5, except that it is only necessary to check the calibration at an approximate flow rate of 0.75 cfm. The calibration of the dry gas meter must be checked after each field use in the same manner. If the value of Y_m obtained before and after a test series differ by more than 5%, the test series shall either be voided, or calculations for the test series shall be performed using whichever meter coefficient value (I.e., before or after) that gives the lower value of total sample volume.

GFAA Spectrometer Same as Method 306, Section 6.2.
ICP Spectrometer Same as Method 306, Section 6.3.

QUALITY CONTROL

Same as Method 306, Section 7.

CALCULATIONS

Pollutant Concentration

Calculate C_{cr}, the Cr concentration in the stack gas, in mg/dscm on a dry basis as follows:

$$Ccr = \frac{(M_{cr})\ (T_m + 460)}{(499.8)\ (Y_m)\ (V_m)\ (P_{bar})} \qquad \text{Eq. 306A-2}$$

Where:

M_{cr} = Amount of Cr in sample from Method 306, Eq. 306-1, Hg.

T_m = Dry gas meter temperature, °F.

Y_m = Dry gas meter correction factor, dimensionless.

V_m = Dry gas meter volume, ft3.

P_{bar} = Barometric pressure, in. Hg.

Approximate Mass Emission Rate (Optional)

Calculate an approximate mass emission rate of Cr in kg/hr using the following equation:

$$kg/hr = (0.0001597)\ (C_{cr})\ (r^2)\ (\sqrt{\Delta p})\ avg \sqrt{\frac{(T_s + 460)}{(P_{bar})\ (28.73)}} \qquad \text{Eq. 306A-3}$$

here:

r	=	Radius of stack, in.
$(\sqrt{\Delta p})_{avg}$	=	Average of $\sqrt{\Delta p}$ values.
T_s	=	Stack temperature, °F.
P_{bar}	=	Barometric pressure, in. Hg.
C_{cr}	=	Concentration of Cr, mg/dscm.

OTE: The emission rate calculated using Equation 306!-3 is based on an assumed moisture content of 2%.

BIBLIOGRAPHY

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SEGALL, R.R., W. G. DEWEES, F. R. CLAY, and J. W. BROWN. Development of Screening Methods for use in Chromium Emissions Measurement and Regulations Enforcement. In: Proceedings of the 1989 EQA/A&WMA International Symposium - Measurement of Toxic and Related Air Pollutants, A&WMA Publication VIP-13, EQA Report No. 600/9-89-060, p. 785.

CLAY, F. R. Chromium Sampling Method. In: Proceedings of the 1990 EQA/A&WMA International Symposium - Measurement of Toxic and Related Air Pollutants, A&WMA Publication VIP-17, EQA Report No. 600/9-90-026, P. 576.

CLAY, F. R. Proposed Sampling Method 306A for the Determination of Hexavalent Chromium Emissions from Electroplating and Anodizing Facilities. In: Proceedings of the 1992 EQA/A&WMA International Symposium - Measurement of Toxic and Related Air Pollutants, A&WMA Publication VIP-25, EQA Report No. 600/R-92/131, P. 209.

APPENDIX IV

FIELD DATA SHEETS

"Before Test Run's"

VANAIRE EMISSION CALIBRATION SHEET

10 MINUTE RUN TIME

DATE: 9-28-98 OPERATOR: David Burcham / Tommy Sutherla

PLANT: Hale Chrome LOCATION: Toledo, Ohio

DRY GAS METER MODEL NO.: 306-A SERIAL NO.: 30613

SCRUBBER MODEL NO.: _____ SERIAL NO.: _____

FAN MODEL NO.: _____ SERIAL NO.: _____

START MOTOR VOL.: 000.000 STOP METER VOL.: 7.462

METER VOLUME: 7.462

GAS METER TEMP.: START: 85° STOP: 88°

GAS METER CORRECTION FACTOR: 1.0005

IN. HG. VAC.: -22 BAROMETRIC PRESSURE: 30.02↑

OUTSIDE TEMP.: 69.1

COMMENTS: _____

"AFTER TEST'S RUN'S"

VANAIRE EMISSION CALIBRATION SHEET

10 MINUTE RUN TIME

DATE: 9-28-98 OPERATOR: David Burchan / Thomas Sutherland

PLANT: Hale Chrome LOCATION: Toledo, OHIO

DRY GAS METER MODEL NO.: 306-A SERIAL NO.: 30613

SCRUBBER MODEL NO.: _____ SERIAL NO.: _____

FAN MODEL NO.: _____ SERIAL NO.: _____

START MOTOR VOL.: 225.500 STOP METER VOL.: 233.1005

METER VOLUME: 7.6005

GAS METER TEMP.: START: 86° STOP: 84°

GAS METER CORRECTION FACTOR: 1.0005

IN. HG. VAC.: -20 BAROMETRIC PRESSURE: 30.021

OUTSIDE TEMP.: 67.3°

COMMENTS: _____

Plant HALE CHROME
Date 9-28-98 Time 09:25
Location TOLEDO, OHIO
Operator(s) David Burcham / Tommy Sutherland
Begining stack temperature, °F 73.0
Ending stack temperature, °F 76.8
Average stack temperature, °F 74.9
OUTSIDE TEMP - 64.1

Circle one:

Schematic of Points

Before Run 1 | Before Run 2 | Before Run 3 | After Run No.

RIGHT

Traverse Point Number	Cyclonic Flow Angle (Degrees)	Δp	√Δp	(√Δp / Σ√Δp) x 5 min = Nuthorical Minutes	Decimal Part of Minute x 60 = Seconds	Whole Minutes + Seconds = Sample Time
1	20	.40	.632	4.906	54.36	4:54
2	3°	.45	.670	5.201	12.06	5.12
3	0°	.50	.707	5.489	29.34	5.29
4	33°	.52	.721	5.597	35.82	5.35
5	25°	.55	.741	5.753	45.18	5.45
6	15°	.50	.707	5.489	29.34	5.29
7	4°	.52	.721	5.597	35.82	5.35
8	5°	.50	.707	5.489	29.34	5.29
9	10°	.20	.447	3.470	28.20	3.28
10	17°	.22	.469	3.641	38.46	3.38
11	24°	.28	.529	4.107	06.42	4.06
12	27°	.35	.591	4.588	35.28	4.35

LEFT

1	25°	.36	.6	4.658	39.48	4.39
2	30°	.22	.469	3.641	38.46	3.38
3	21°	.22	.469	3.641	38.46	3.38
4	47°	.30	.547	4.246	14.76	4.14
5	22°	.33	.574	4.456	27.36	4.27
6	22°	.30	.547	4.246	14.76	4.14
7	5°	.55	.741	5.753	45.18	5.45
8	0°	.62	.787	6.110	06.60	6.06
9	4°	.60	.774	6.009	00.54	6.00
10	5°	.62	.787	6.110	06.60	6.06
11	3°	.55	.741	5.753	45.18	5.45
12	3°	.63	.793	6.156	09.36	6.09
	Avg 14.6		Avg 0.644			

9/28/98

Figure 306A-2. Velocity Traverse and Point Sample Time Calculation Sheet.

Figure 306A-3. Chromium Constant Sampling Rate Field Data Sheet

[redacted] HALE CHROME/TOLEDO, OHIO
Sampling Site ROOF
Total Cr catch, M_{cr}, µg
Dry gas meter temp, T_m, °F 104.9
Meter correction factor, Y_d 1.0005
Meter volume, V_m, ft³ 71.801
Barometric press, P_{bar}, in. Hg 30.02↑
Start clock time 12:04
Stop clock time 14:10

Date 9-28-98 Run Number 1
Operator David Burcham / Tommy Sutherland
Stack Radius, r, in. 34"DIA / 17"Radius
Avg sq. rt. Δp, $(\sqrt{\Delta p})_{avg}$, in. H_2O .644
Stack temp, T_s, °F 79.2 / 85.3°
Leak rate before run, cfm .005
Leak rate after run, cfm .005
Stop meter volume, ft³ 080.906
Start meter volume, ft³ 009.105

REMARKS: IN HG. VAC - -20

LEFT

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)
[redacted]	4:39	106°
[redacted]	3:38	108°
3	3:38	109°
[redacted]	4:14	110°
[redacted]	4:27	107°
6	4:14	107°
[redacted]	5:45	107°
[redacted]	6:06	110°
9	6:00	112°
[redacted]0	6:06	112°
[redacted]1	5:45	113°
12	6:09	114°

RIGHT

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)
1	4:54	92°
2	5:12	94°
3	5:29	96°
4	5:35	99°
5	5:45	100°
6	5:29	100°
7	5:35	102°
8	5:29	104°
9	3:28	104°
10	3:38	104°
11	4:06	104°
12	4:35	105°

$$C_{cr} = \frac{(M_{cr})(T_m + 460)}{(499.8)(Y_d)(V_m)(P_{bar})}$$

$$kg/hr = (C_{cr})(0.0001597)(r^2)(\sqrt{\Delta p})_{avg}\sqrt{\frac{(T_s + 460)}{(P_{bar})(28.73)}}$$

mg/cubic meter, (C_{cr}) _____ (Optional) kg/hr _____

9/28/98

Figure 306A-3. Chromium Constant Sampling Rate Field Data Sheet

[redacted] HALE CHROME / TOLEDO, OHIO
Sampling Site ROOF
Total Cr catch, M_{cr}, µg
Dry gas meter temp, T_m, °F 109.7
Meter correction factor, Y_m 1.0005
Meter volume, V_m, ft³ 69.269
Barometric press, P_{bar}, in. Hg 30.021
Start clock time 14:43
Stop clock time 16:45

Date 9-28-98 Run Number 2
Operator DAVID BURCHAM / THOMAS CHERLAND
Stack Radius, r, in. 34" DIA / 17" RADIUS
Avg sq. rt. Δp, $(\sqrt{\Delta p})_{avg}$, in. H_2O .644
Stack temp, T_s, °F 86.7° / 83.1
Leak rate before run, cfm .005
Leak rate after run, cfm .005
Stop meter volume, ft³ 150.474
Start meter volume, ft³ 081.205

REMARKS: IN Hg. VAC - 24.5

LEFT

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)
1	4:39	114°
2	3:38	112°
3	3:38	112°
4	4:14	113°
5	4:27	113°
6	4:14	114°
7	5:45	114°
8	6:06	115°
9	6:00	115°
10	6:06	116°
11	5:45	116°
12	6:09	118°

RIGHT

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)
1	4:54	118°
2	5:12	118°
3	5:29	114°
4	5:35	114°
5	5:45	116°
6	5:29	116°
7	5:35	114°
8	5:29	100°
9	3:28	98°
10	3:38	96°
11	4:06	95°
12	4:35	92°

$$\frac{(M_{cr})(T_m + 460)}{(499.8)(Y_m)(V_m)(P_{bar})}$$

$$kg/hr = (C_{cr})(0.0001597)(r^2)(\sqrt{\Delta p})_{avg}\sqrt{\frac{(T_s + 460)}{(P_{bar})(28.73)}}$$

µg/cubic meter, (C_{cr}) _____ (Optional) kg/hr _____

[redacted] 12/20/98

Figure 306A-3. Chromium Constant Sampling Rate Field Data Sheet

HALE CHROME/TOLEDO, OHIO

Sampling Site ROOF

Total Cr catch, M_{cr}, µg _____

Dry gas meter temp, T_m, °F 90.8°

Meter correction factor, Y_m 1.0005

Meter volume, V_m, ft³ 73.721

Barometric press., P_{bm}, in. Hg 30.027

Start clock time 17:10

Stop clock time 19:13

Date 9-28-98 Run Number 3

Operator DAVID BURCHAM / THOMAS SUTHERLAND

Stack Radius, r, in. 34" DIA / 17" RADIUS

Avg sq. rt. Δp, $(\sqrt{\Delta p})_{Avg}$, in. H_2O .644

Stack temp, T_s, °F 89.2 / 81.5

Leak rate before run, cfm <.005

Leak rate after run, cfm <.01

Stop meter volume, ft³ 224.821

Start meter volume, ft³ 151.100

REMARKS: IN HG. VAC - 22.5

LEFT

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)
1	4:39	94°
2	3:38	95°
3	3:38	95°
4	4:14	96°
5	4:27	96°
6	4:14	97°
7	5:45	97°
8	6:06	96°
9	6:00	94°
10	6:06	92°
11	5:45	92°
12	6:09	91°

RIGHT

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)
1	4:54	82°
2	5:12	82°
3	5:29	83°
4	5:35	84°
5	5:45	84°
6	5:20	86°
7	5:35	88°
8	5:20	90°
9	3:25	91°
10	3:38	91°
11	4:06	91°
12	4:35	93°

$$\frac{(M_{cr})(T_m + 460)}{(499.8)(Y_m)(V_m)(P_{bm})}$$

$$kg/hr = (C_{cr})(0.0001597)(r^2)(\sqrt{\Delta p})_{Avg}\sqrt{\frac{(T_s + 460)}{(P_{bm})(28.73)}}$$

mg/cubic meter, (C_{cr}) _____

(Optional) kg/hr _____

Robert Kim 8/28/98

MAGNEHELIC Readings
HALE CHrome, TOLEDO OHIO
18,000 SYSTEM
STAGE 1 - .55
STAGE 2 - 3.3
STAGE 3 - .2
OVERALL - 4.2

APPENDIX V

SAMPLE ANALYSIS SHEETS

BEFORE TEST RUN #1
VANAIRE EMISSION CALIBRATION SHEET

10 MINUTE RUN TIME

DATE: 9-28-98

OPERATOR: DAVID BURCHAM

PLANT: HALE CHROME

LOCATION: TOLEDO, OH

DRY GAS METER MODEL NO.: 306 A

SERIAL NO.: 30613

SCRUBBER MODEL NO.: CH-11

SERIAL NO.: P51727

FAN MODEL NO.: VC-730

SERIAL NO.: P51726

START MOTOR VOL.: 000.000

STOP METER VOL.: 7.462

METER VOLUME: 7.462

GAS METER TEMP. START: 85°

STOP: 88°

GAS METER CORRECTION FACTOR: 1.0005

IN. HG. VAC.: -22.0

BAROMETRIC PRESSURE: 30.02R

OUTSIDE TEMP.: 69.1 °

COMMENTS:

AFTER TEST RUN #2
VANAIRE EMISSION CALIBRATION SHEET

10 MINUTE RUN TIME

DATE: 9-28-98 OPERATOR: DAVID BURCHAM

PLANT: HALE CHROME LOCATION: TOLEDO,OHIO

DRY GAS METER MODEL NO.: 306-A SERIAL NO.: 30613

SCRUBBER MODEL NO.: CH-1 SERIAL NO.: P51727

FAN MODEL NO.: VC 730 SERIAL NO.: P51726

START MOTOR VOL.: 225.500 STOP METER VOL.: 233.1005

METER VOLUME: 7.6005

GAS METER TEMP. START: 86° STOP: 84°

GAS METER CORRECTION FACTOR: 1.0005

IN. HG. VAC.: -20 BAROMETRIC PRESSURE: 30.02R

OUTSIDE TEMP.: 67.3°

COMMENTS:

_____

_____

_____

_____

_____

$$\frac{(M_{CR})\,(T_M + 460)}{(499.8)\,(LY_M)\,(V_M)\,(P_{BAR})}$$

RUN #1: $\frac{(4.1)\,(104.9 + 460)}{(499.8)\,(1.0005)(\,71.801)\,(30.02)} = .00214\ mg/m^3$

RUN #2 $\frac{(9.0)\,(109.7 + 460)}{(499.8)\,(1.0005)\,(69.269)\,(30.02)} = .00493\ mg/m^3$

RUN #3 $\frac{(11.2)\,(90.8 + 460)}{(499.8)\,(1.0005)\,(73.721)\,(30.02)} = .00557\ mg/m^3$

SEPTEMBER 28, 1998

HALE CHROME
18000 CFM System
Pressure Drop Observed on Chromax During Test

Stage 1	0.55" H_2O
Stage 2	3.3" H_2O
Stage 3	0.2" H_2O
OVER ALL	4.2" H_2O

HALE CHROME WO# 5587

	TEST 1	TEST 2	TEST 3
TOTAL CR CATCH Mcr Ng	4.1	9.0	11.2
AVG DRY GAS METER TEMP Tm ° F	104.9	109.7	90.8
METER CORRECTION FACTOR, Ym	1.0005	1.0005	1.0005
METER VOLUME, Vm, Ft^3	71.801	69.269	73.721
BAROMETRIC PRESS, Pb in Hg	30.02	30.02	30.02

$$Ccr\ Cmg/Cubic\ Meter = \frac{(Mcr)\ (Tm + 460)}{(499.8)\ (Ym)\ (Pb)\ (Vm)}$$

AVERAGE EMISSION RATE = 0.00421 mg/DSCM

Environmental Consultants, inc.
Professional Laboratory Services

LABORATORY REPORT

Vanaire
10151 Bunsen Way
Louisville, KY 40299

Attn: Mr. Michael Vanegas

Date Received: 09/30/1998 Report Date: 10/06/1998
Client Number: 007776 Order No: 1998090537
P.O. No.: 5587 Project Number: Hale Chrome
Released By:

Order No: 1998090537
COC No: 2976

ANALYTICAL RESULTS

SAMPLE INFORMATION

SAMPLE NO: 1 Collection Date: 09/28/1998 Sample Matrix: Impenger Fluid Sample Type: Composite
Collected By: D. Burcham Sample Location: Stack Sample #1
Special Instructions:

METALS

PARAMETER	RESULT	UNITS	DETECTION LIMIT	ANALYST	DATE ANALYZED	METHOD	QC ID NO
Chromium, total	4.1	ug	1.00	TLH	10/01/1998	EPA 306	500132

SAMPLE INFORMATION

SAMPLE NO: 2 Collection Date: 09/28/1998 Sample Matrix: Impenger Fluid Sample Type: Composite
Collected By: D. Burcham Sample Location: Stack Sample #2
Special Instructions:

METALS

PARAMETER	RESULT	UNITS	DETECTION LIMIT	ANALYST	DATE ANALYZED	METHOD	QC ID NO
Chromium, total	9.0	ug	1.00	TLH	10/01/1998	EPA 306	500132

SAMPLE INFORMATION

SAMPLE NO: 3 Collection Date: 09/28/1998 Sample Matrix: Impenger Fluid Sample Type: Composite
Collected By: D. Burcham Sample Location: Stack Sample #3
Special Instructions:

RECEIVED OCT 0 9 1998

SAMPLE INFORMATION

SAMPLE NO: 3 Collection Date: 09/28/1998 Sample Matrix: Impenger Fluid Sample Type: Composite
Collected By: D. Burcham Sample Location: Stack Sample #3
Special Instructions:

METALS

PARAMETER	RESULT	UNITS	DETECTION LIMIT	ANALYST	DATE ANALYZED	METHOD	QC ID NO
Chromium, total	11.2	ug	1.00	TLH	10/01/1998	EPA 306	500132

SAMPLE INFORMATION

SAMPLE NO: 4 Collection Date: 09/28/1998 Sample Matrix: Impenger Fluid Sample Type: Composite
Collected By: D. Burcham Sample Location: Blank Sample
Special Instructions:

METALS

PARAMETER	RESULT	UNITS	DETECTION LIMIT	ANALYST	DATE ANALYZED	METHOD	QC ID NO
Chromium, total	<1.	ug	1.00	TLH	10/01/1998	EPA 306	500132

Environmental Consultants, inc.

Professional Laboratory Services

QUALITY CONTROL NARRATIVE
LEVEL 1
Prepared Date: 10/06/98

The QC data presented in this report has been reviewed for compliance in accordance with the Environmental Consultants, Inc. QA/QC program. All QC data has been found to be within established control limits and/or requirements with the exception of those items noted below. Exceptions are noted for each item.

The following items are included in this report for the period: 10/06/98 to 10/06/98

1. Blank Results: All blank results are reported for the referenced period.

   Exception: NONE

2. Duplicate Results: All duplicate results are reported for the referenced period. Please note that samples are randomly elected at required frequencies for each matrix type and may not be performed upon the sample submitted.

   Exception: NONE

3. Matrix Spike/ Matrix Spike Duplicate Results: All spike results are reported for the referenced period. Please note that samples are randomly selected at required frequencies for each matrix type and may not be performed upon the sample submitted.

   Exception: NONE

4. Reference Standard Results: All results are reported for the referenced period.

   Exception: NONE

Reviewer: John Wilson Title: QA/QC Coordinator Date: 10/7/98

Released by: John Wilson Title: QA/QC Coordinator Date: 10/7/98

Prepared For: Vanalre
10151 Bunsen Way
Louisville, Ky 40299

Environmental Consultants, Inc.
Professional Laboratory Services

Method Blank Analysis
Order Number 1998090537

Parameter	Batch Number	Detection Limit	Result (mg/L)	Minimum Control Limit	Maximum Control Limit
Chromium, total	500132	0.001	<0.001	0	0.001

Duplicate Analysis
Order Number 1998090537

Parameter	Batch Number	Sample Result (ug)	Duplicate Result (ug)	RPD	Minimum Control Limit	Maximum Control Limit
Chromium, total	500132	4.1	4.3	4.76	0	20

Environmental Consultants, Inc.
Professional Laboratory Services

Matrix Spike Analysis
Order Number 1998090537

Parameter	Batch Number	Sample Result (ug)	Spiking Level (ug)	Spiked Sample Result (ug)	Percent Recovery	Minimum Control Limit	Maximum Control Limit
Chromium, total	500132	4.1	7.5	12	105	80	120

Environmental Consultants, Inc.
Professional Laboratory Services

Reference Standard Analysis
Order Number 1998090537

Parameter	Batch Number	Standard Level (mg/L)	Result (mg/L)	Minimum Control Limit	Maximum Control Limit
Chromium, total	500132	0.0097	0.01	0.008	0.012

CHROMIUM EMISSION TEST

Court Metal Finishing Inc.
Unit G 5200 Clio Rd.
Flint, MI 48504

TEST PERFORMED BY:

VANAIRE DIVISION
VANEGAS ENTERPRISES
10151 BUNSEN WAY
LOUISVILLE, KY 40299

March 17, 1998

CERTIFICATION

This is to certify that the test data was gathered and recorded in accordance with the requirements of Method 306A as outlined in the Federal Register 40CFR 63.344

DAVID BURCHAM
Test Technician

This is to certify that this report is authentic and accurate with all sample evaluations and calculations in accordance with 40 CFR 63.344

JAMES R. BULLEN, JR.
Project Manager
Vanaire

This is to certify that I have examined this report and find it to be accurate and authentic with all sample evaluations and calculations in accordance with 40CFR 63.344

G.J. VANEGAS P.E.
President
Vanegas Enterprises

A Division of Vanegas Enterprises Inc.
10151 BUNSEN WAY
LOUISVILLE, KY 40299
TEL: (502) 491-3553
FAX: (502) 491-5182

March 17, 1998

Court Metal Finishing Inc.
Unit G 5200 Clio Rd.
Flint, MI 48504

ATTN: Mrs. Frieda Stong

SUBJECT: TEST REPORT

Dear Mrs. Stong:

Please find enclosed the revised test report for your chrome emissions test on the 14000 CFM Exhaust System.

Should you have any questions or require additional information, please contact me.

Sincerely,

Jim Bullen
Project Manager

Enclosures

Air Pollution Control Equipment

TABLE OF CONTENTS

INTRODUCTION

PLANT OWNER: COURT METAL FINISHING

PURPOSE: TO DETERMINE EMISSION OF CHROME FROM TWO CHROME PLATING SYSTEM

TESTED BY:

DAVID BURCHAM - TECHNICIAN

PREPARED BY:

JAMES R. BULLEN, JR.
PROJECT MANAGER-VANAIRE

DATE TESTED: 2/23/98

POLLUTANTS: TOTAL CHROME

TEST WITNESSED BY:

FRIEDA STONG
PLANT MANAGER
COURT METAL FINISHING

SUMMARY OF TEST RESULTS

Emission Test Results:

Run #1	<	0.00752mg/DSCM
Run #2	<	0.00570mg/DSCM
Run #3	<	0.00478mg/DSCM
Average	<	0.0060mg/DSCM

Allowable Emission Rate 0.030mg/DSCM

Operating Level - The chrome plating tanks were operated at or above normal operating conditions and approaching maximum capacity during entire test. See page 3 (Facility Operation During Testing) for details.

Samples collected were stored and transported to Louisville Testing Laboratory Inc. in an ice bath to maintain a temperature of 40° F.

FACILITY OPERATION DURING TESTING

This system tested consisted of one (1) hard chrome plating tank that is vented through PVC Hoods and duct. The exhaust duct then goes into a pre-controller. The gas then passes into a three (3) stage Vanaire composite mesh pad scrubber. A fan immediately following the Chromax exhausts the clean air into the atmosphere.

SAMPLING
AND ANALYTICAL PROCEDURES

Sample Collection:

Samples were collected from the fan outlet duct (See Appendix I). The point locations are 90° apart in the 30" diameter duct with 9 feet, or (3.6) duct diameters of straight duct upstream and 5 feet, or (2) duct diameters downstream.

Sampling Method:

Method 306A (40CFR 63) was used for the sample collection. A full description of the sampling train, schematic drawing of the sample train, and sample collection procedure is contained in Appendix III. The field data sheets and calculations are contained in Appendix IV.

Sample Analysis

The samples collected were analyzed by:

Environmental Consultants Inc.
391 Newman Ave.
Clarksville, IN 47129

The analysis results and methods used are contained in Appendix V.

APPENDIX I

DRAWINGS
DC-97-55101

APPENDIX II

OPERATING CONDITIONS

OPERATING CONDITIONS

The chrome plating bath was operated at or above normal operating conditions during the entire test. (See following pages)
The samples collected were stored and transported to Environmental Consultants Inc. in Clarksville, IN in an ice bath to maintain a temperature of 40° F.

SOLUTION ATTENDANT CHECK SHEET

DATE: 5-31-97

	TIME:	TIME:	TIME:	TIME:	TIME:	TIME:	TIME:	TIME:
CLEANER	11-30 PM	1 AM	3 AM	5 AM				
Temp (°F)	150°	150°	148°	149°				
Solution Level	OK	OK	OK	OK				
Amps & Volts	350 / 4.5	350 / 4.5	350 / 4.0	350 / 4.0				
Oil Skimmer #1	OK	OK	OK	OK				
Oil Skimmer #2	OK	OK	OK	OK				
RINSE								
Oil Skimmer	OK	OK	OK	OK				
REVERSE ETCH								
Temp (°F)	139°	138°	138°	138°				
Solution Level	OK	OK	OK	OK				
Chrome Rinse (°F)	131°	132°	132°	132°				
CHROME PLATE								
Temp (°F)	142°	142°	142°	142°				
Solution Level	OK	OK	OK	OK				
Amps & Volts	760 / 7.7	760 / 7.7	750 / 7.7	750 / 7.7				
Chrome Pumps	OK	OK	OK	OK				
Air Scrubber	2.7 / OK	2.8 / OK	3.2 / OK	2.9 / OK				
Sprays	OK	OK	OK	OK				
STRIP								
Temp (°F)	154°	153°	153°	154°				
Solution Level	OK	OK	OK	OK				
Amps & Volts	700 / 7.4	710 / 7.5	700 / 7.3	710 / 7.3				
Sprays	OK	OK	OK	OK				
HOT RINSE								
Temp (°F)	178	177°	176°	177°				
LEADERS INITIALS & SHIFT	DJ / 3rd	DJ / 3rd	DJ / 3rd	DJ / 3rd				

FORM

SOLUTION ATTENDANT CHECK SHEET

DATE: 10-31-97 9714 & 9713 9714

	TIME:	TIME:	TIME:	TIME:	TIME:	TIME:	TIME:	TIME:
CLEANER	7:00 am	9:00 am	11:00 am	1:00 pm	3:00 pm	5:00 pm	7:00 pm	9:00 pm
Temp (°F)	151°	147°	147°	150°	150°	150°	150°	150°
Solution Level	OK	OK	OK	OK	OK	OK	OK	OK
Amps & Volts	350/4.7	350/4.0	350/3.9	350/3.9	350/3.9	350/3.9	350/4.5	350/4.4
Oil Skimmer #1	OK	OK	OK	OK	OK	OK	OK	OK
Oil Skimmer #2	OK	OK	OK	OK	OK	OK	OK	OK
RINSE								
Oil Skimmer	OK	OK	OK	OK	OK	OK	OK	OK
REVERSE ETCH								
Temp (°F)	139°	138°	138°	135°	135°	140°	138°	138°
Solution Level	OK	OK	OK	OK	OK	OK	OK	OK
Chrome Rinse (°F)	134°	132°	132°	133°	132°	132°	132°	132°
CHROME PLATE								
Temp (°F)	143°	144°	142°	143°	142°	142°	145°	142°
Solution Level	OK	OK	OK	OK	OK	OK	OK	OK
Amps & Volts	7550/7.7	7550/7.7	7500/7.7	7500/7.7	7500/7.7	7500/7.7	7500/7.6	7500/7.6
Chrome Pumps	OK	OK	OK	OK	OK	OK	OK	OK
Air Scrubber	2.7	2.7	2.7	2.8	2.7	2.4	2.7	2.6
Sprays	OK	OK	OK	OK	OK	OK	OK	OK
STRIP								
Temp (°F)	154°	153°	154°	154°	154°	154°	153°	154°
Solution Level	OK	OK	OK	OK	OK	OK	OK	OK
Amps & Volts	710/7.7	710/7.4	720/7.5	710/7.4	720/7.4	720/7.4	700/7.4	700/7.4
Sprays								
HOT RINSE								
Temp (°F)	178°	177°	178°	177°	177°	177°	176°	178°
LEADERS INITIALS & SHIFT	1st R.C.R.	1st R.C.R.	1st R.C.R	RCR.	2nd SS	2nd SS	2nd SS	2nd SS

FORM Rev C

APPENDIX III

CHROMIUM EMISSION
TEST PROCEDURE
METHOD 306A

APPENDIX III

CHROMIUM EMISSION TEST PROCEDURE METHOD 306A

Applicable to the measurement of Chromium (Cr) in emission from Hard Chrome electroplating, decorative Chrome Electroplates, and Chrome Anodizing.

Your Vanaire Model 306A Sampling train will extract a sample of the air stream at a constant rate determined by a critical orifice. The sample is collected in an impinger (Mason Jar) which is subsequently sent to a laboratory for quantitative analysis of the chromium content.

The concentration of Chromium will be determined by any of the following analytical methods:

ICE - Inductively coupled plasma emission spectrometry

GFAAS - Graphite furnace atomic absorption spectrometry

IC/PCR - Ion chromatography with a post-column reactor

SAMPLING TRAIN

A schematic of the sampling train is shown in Figure 306A-1. All necessary components, except chemicals are included in your Vanaire 306A Unit.

IMPINGERS

One quart capacity "Mason" glass canning jars with vacuum seal lids are used. Three impingers are required: the first is for collecting the absorbing solution, the second is empty and is used to collect any absorbing solution carried over from the first impinger, and the third contains the drying agent.

MANOMETER

Inclined/vertical type, as described in Section 2.2 of Method 2 (40 CFR Part 60, Appendix A).

CRITICAL ORIFICE

The critical orifice is a small restriction in the sample line (approximately 1/16 inch in diameter) that is located upstream of the vacuum pump and sets the sample rate at about 0.75 cfm.

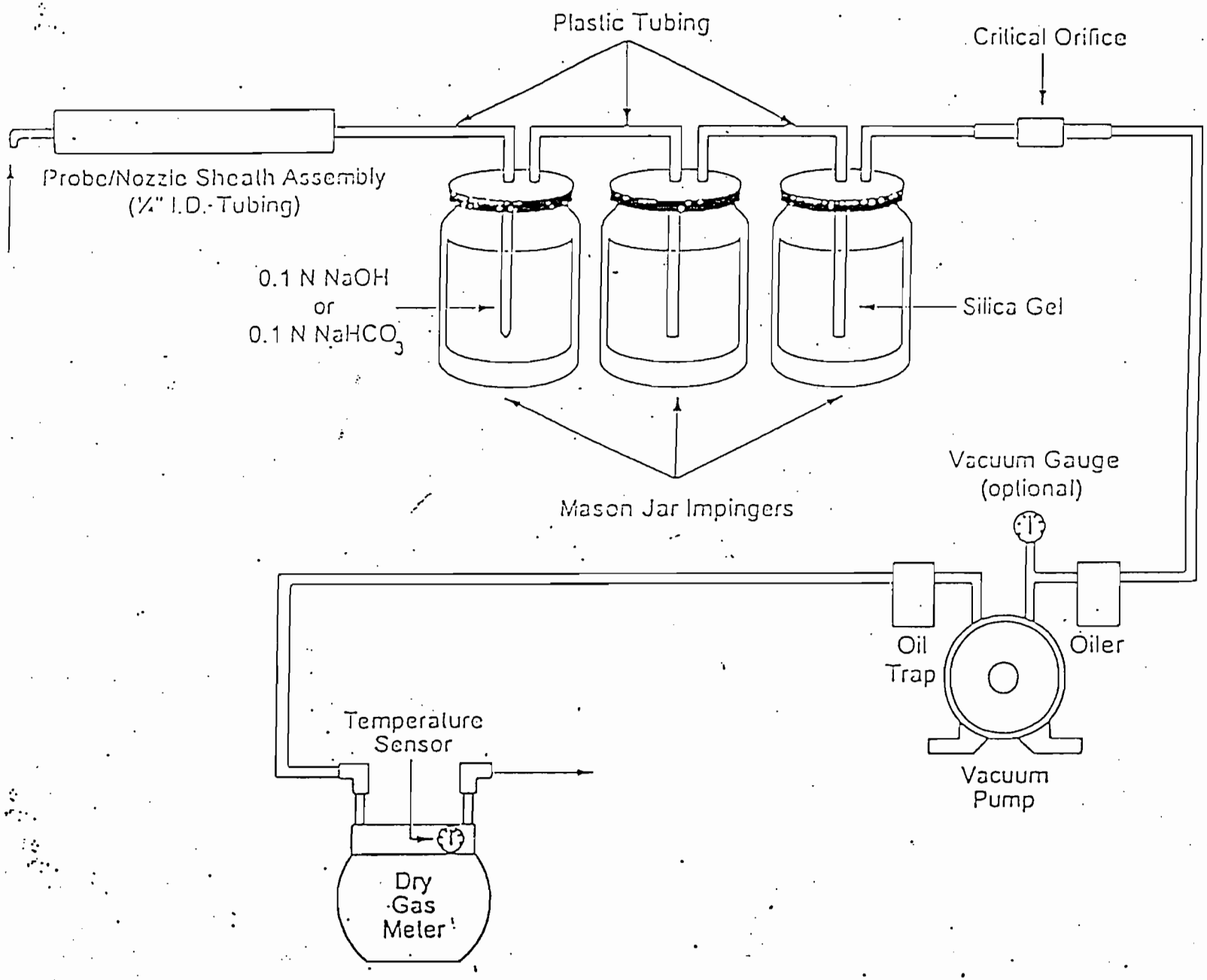

Figure 306A-1. Sampling Train Schematic.

APPENDIX III

PUMP OILER

A glass oil reservoir with a wick mounted at the vacuum pump inlet lubricates the pump vanes. The oiler is an inline type and not vented to the atmosphere.

VACUUM PUMP

Gast Model 0522-V103-G18DX is capable of delivery at least 1.5 cfm at 15 in. Hg vacuum.

OIL TRAP

An empty glass oil reservoir without wick is mounted at pump outlet to prevent oil from reaching the dry gas meter.

DRY GAS METER

A Rockwell Model 175-S test meter, with a thermometer installed to monitor meter temperature. The dry gas meter is capable of measuring volume to within 2%.

SAMPLE RECOVERY

Wash Bottles. These are glass or inert plastic, 500 or 1000 ml, with spray tube.

REAGENTS

Sampling

Water. Reagent water that conforms to ASTM Specification D1193-77, Type II (incorporated by reference - see 63.14). It is recommended that water blanks be checked prior to preparing sampling reagents to ensure that the Cr content is less than the analytical detection limit.

Solium Hydroxide (NaOH) Absorbing Solution. 0.1 N or Sodium Bicarbonate ($NaHCO_3$) Absorbing Solution, 0.1 N. Dissolve 4.0 g of sodium hydroxide in 1) of water, or dissolve 8.5 g of sodium bicarbonate in 1) of water.

Sample Recovery

0.1 N NaOH or 0.1 N $NaHCO_3$. Use the same solution for recovery as was used in the impingers.

Velocity Pressure Traverse

Perform a velocity pressure traverse before the first sample run. Figure 306A-2 may be used to record velocity pressure data. If testing occurs over several days, perform the traverse at the beginning of each day. Perform velocity pressure traverses as specified in Section 3 of Method 2, but record only the Δp (velocity head) values for each sampling point.

Check for cyclonic flow during the first traverse to verify that it does not exist; if cyclonic flow does exist, make sure that the absolute average angle of misalignment does not exceed 20 degrees. If the average angle of misalignment exceeds 20 degrees at an outlet location, install straightening vanes to eliminate the cyclonic flow. If it is necessary to test an inlet location where cyclonic flow exists, it may not be possible to install straightening vanes. In this case, a variation of the alignment method must be used. This must be approved by the Administrator.

Point Sampling Times

Since the sampling rate of the train is held constant by the critical orifice, it is necessary to calculate specific sampling times for each point in order to obtain a proportional sample. If all sampling can be completed in a single day, it is necessary to calculate the point sampling times only once. If sampling occurs over several days, recalculate the point sample times each day using velocity traverse data obtained earlier in the day. Determine the average of the Δp values obtained during the velocity traverse (Figure 306A-2). Calculate the sampling times for each point using Equation 306A-1. Convert the decimal parts of minutes to seconds. If the stack diameter is less than 12 inches, use 7.5 minutes in place of 5 minutes in the equation and 16 sampling points.

$$\text{Minutes at point n} = \sqrt{\frac{\text{Point n } \Delta p}{(\sqrt{\Delta p})\text{ avg.}}} \times 5 \text{ minutes} \quad \text{Eq. 306A-1}$$

where:

n = Sampling point number.

Δp = Velocity head measured by Type-S pitot tube, in. H_2O

Preparation of Sampling Train

Assemble the sampling train as shown in Figure 306A-1. Before charging, rinse the first mason jar impinger with either 0.1 N sodium hydroxide (NaOH) or 0.1 N sodium bicarbonate ($NaHCO_3$); discard the solution. Put 250 ml of 0.1 N NaOH or 0.1 N $NaHCO_3$ absorbing solution into the first mason jar impinger. Similarly, rinse the second mason jar impinger and leave empty. Put silica gel into the third mason jar impinger until the impinger is half full. Place the impingers into an ice bath and check to ensure that the lids are tight.

Train Leak Check Procedure

Wait until the ice has cooled the impingers before sampling. Next, seal the nozzle with a finger covered by a piece of clear plastic wrap and turn on the pump. The vacuum in the line between the pump and the critical orifice must be at least 15 in. Hg. Observe any leak rate on the dry gas meter. The leak rate should not exceed 0.02 cfm.

Figure 306A-2: Velocity Traverse and Point Sample Time Calculation Sheet

Plant _____
Date _____ Time _____
Location _____
Operator(s) _____
Beginning stack temperature, °F _____
Ending stack temperature, °F _____
Average stack temperature, °F _____

Circle one:

Before Run 1 Before Run 2 Before Run 3 After Run No.

Schematic of Points

Traverse Point Number	Cyclonic Flow Angle (Degrees)	Δp	$\sqrt{\Delta p}$	$\frac{\sqrt{\Delta p}}{(\sqrt{\Delta p})_{avg}} \times 5$ min = Numerical Minutes	Decimal Part of Minute x 60 = Seconds	Whole Minutes + Seconds = Sample Time
	Avg		Avg			

ampling Train Operation

ecord all pertinent process and sampling data on the data sheet (see Figure 306A-3). Ensure that the process peration is suitable for sample collection.

lace the probe/nozzle into the duct at the first sampling point and turn on the pump. A minimum vacuum of 15 n. Hg or 0.47 atmosphere between the critical orifice and pump is required to maintain critical flow. Sample for the time interval previously determined for that point. Move to the second point and sample for the time interval etermined for that point; sample all points on the traverse in this manner. Keep ice around the impingers during he run. Complete the traverse and turn off the pump. Move to the next sampling port and repeat. Record the final dry gas meter reading. (NOTE: If an approximate mass emission rate is desired, record the stack emperature before and after the run.)

Post Test Leak Check

Remove the probe assembly and flexible tubing from the first impinger. Do not cover the nozzle. Seal the inlet tube of the first impinger with a finger covered by clear plastic wrap and turn on the pump. The vacuum in the ine between the pump and the critical orifice must be at least 15 in. Hg. Observe any leak rate on the dry gas meter. If the leak rate exceeds 0.02 cfm, reject the run. If the leak rate is acceptable, take the probe assembly and impinger assembly to the sample recovery area.

Sample Recovery

Container No. 1. After the train has been moved to the sample recovery area, disconnect the tubing that joins the first impinger with the second.

The first impinger jar is also used as the sample container jar. Unscrew the lid from the first impinger jar. Lift the inlet/outlet tube assembly almost out of the jar, and using the wash bottle, rinse the outside of the impinger tip that was immersed in the impinger jar with extra absorbing solution; rinse the inside of the tip as well.

Recover the second impinger by removing the lid and pouring any contents from the second impinger into the first impinger. Rinse the second impinger including the inside and outside of the impinger stem as well as any connecting plastic tubing with extra absorbing solution and place the rinse into the first impinger.

Hold the nozzle and connecting plastic tubing in a vertical position so that the tubing forms a "U". Using the wash bottle, partially fill the tubing with sampling reagent. Raise and lower the end of the plastic tubing several times to cause the reagent to contact the major portion of the internal parts of the assembly thoroughly. Do not raise the solution level too high or part of the sample will be lost. Place the nozzle end of the assembly over the mount of the first impinger jar (sample container) and elevate the plastic tubing so that the solution flows rapidly out of the nozzle. Perform this procedure three times. Next, repeat the recovery procedure but allow the solution to flow rapidly out the open end of the plastic tubing into the first impinger jar.

Place a piece of clear plastic wrap over the mouth of the first impinger jar. Use a standard lid and band assembly to seal the jar. Label the jar with the sample number and mark the liquid level to gauge any losses during handling.

Container No. 2 (Reagent Blank)

Place approximately 500 ml of the 0.1 N NaOH or 0.1 N $NaHCO_3$ absorbing solution in a labeled sample container.

Figure 306A-3. Chromium Constant Sampling Rate Field Data Sheet

Plant _____ Date _____ Run Number _____

Sampling Site _____ Operator _____

Total Cr catch, M_{cr}, µg _____ Stack Radius, r, in. _____

Avg dry gas meter temp, T_m, °F _____ Avg sq. rt. Δp, $(\sqrt{\Delta p})_{avg}$ in. H_2O _____

Meter correction factor, Y_m _____ Stack temp, T_s, °F _____

Meter volume, V_m, ft^3 _____ Leak rate before run, cfm _____

Barometric press, P_{bar} in. Hg _____ Leak rate after run, cfm _____

Start clock time _____ Stop meter volume, ft^3 _____

Stop clock time _____ Start meter volume, ft^3 _____

REMARKS: _____

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)

$$C_{cr} = \frac{(M_{cr})(T_m + 460)}{(499.8)(Y_m)(V_m)(P_{bar})}$$

$$kg/hr = (C_{cr})(0.0001597)(r^2)(\sqrt{\Delta p})_{avg}\sqrt{\frac{(T_s + 460)}{(P_{bar})(28.73)}}$$

mg/cubic meter, (C_{cr}) _____ (Optional) kg/hr _____

Sample Preservation for IC/PCR

If the sample is to be analyzed for Cr^{+6} by IC/PCR, it must be filtered immediately following recovery as described in Section 5.2.3 of Method 306.

Analysis

Sample preparation and analysis procedures are identical to Method 306, Section 5.3.

CALIBRATION

Dry Gas Meter

Dry gas meter calibrations may be performed by either the manufacturer, a firm who provides calibration services, or the tester. The dry gas meter calibration coefficient (Y_m) must be determined prior to initial use of the meter, and must be checked following each field use.

If the dry gas meter is new, the manufacturer will have specified the Y_m for the meter. The manufacturer may also have included a calibration orifice and a data sheet with the meter that may be used for calibration purposes. The sheet will specify a standard cubic foot volume and a sample time, and these values were determined when the orifice was used to set the initial Y_m for the meter. The Y_m may be checked by disconnecting the critical orifice in the sampling train and replacing it with the calibration orifice. The inlet side of the calibration orifice is open to the atmosphere and is not reconnected to the sample train. Record the initial dry gas meter volume and meter temperature. Turn on the pump and operate it for the number of minutes specified by the manufacturer's data sheet. Stop the pump and record the final dry gas meter volume and temperature. Subtract the start volume from the stop volume and average the temperatures. Check the Y_m for the dry gas meter after the test by using the following equation:

$$Y = \frac{Ft.^3_m (T_m - 460)}{17.647 (Ft^3_{pf}) (P_{bar})}$$

Where:

$Ft.^3_m$ = Cubic feet given by meter manufacturer

T_m = Temperature of meter in degrees Fahrenheit

Ft^3_{pf} = Cubic feet from dry gas meter, post test

P_{bar} = Barometric pressure in inches of mercury

Compare the Y_m just calculated with the Y_m given by the manufacturer:

$$\frac{Y_m \text{ (manufacturer)}}{Y_m \text{ (calculated after test)}}$$

If this value is between 0.95 and 1.05, the Y_m of the meter is acceptable. If the value lies outside the specified range, the test series shall either be voided, or calculations for the test series shall be performed using whichever meter coefficient value (i.e., before and after) that gives the lower value of total sample volume. Return the dry gas meter to the manufacturer for recalibration.

The calibration may also be conducted as specified in Section 5.3.1 or Section 7 of Method 5, except that it is only necessary to check the calibration at an approximate flow rate of 0.75 cfm. The calibration of the dry gas meter must be checked after each field use in the same manner. If the value of Y_m obtained before and after a test series differ by more than 5%, the test series shall either be voided, or calculations for the test series shall be performed using whichever meter coefficient value (I.e., before or after) that gives the lower value of total sample volume.

GFAA Spectrometer Same as Method 306, Section 6.2.
ICP Spectrometer Same as Method 306, Section 6.3.

QUALITY CONTROL

Same as Method 306, Section 7.

CALCULATIONS

Pollutant Concentration

Calculate C_{cr}, the Cr concentration in the stack gas, in mg/dscm on a dry basis as follows:

$$C_{cr} = \frac{(M_{cr})\ (T_m + 460)}{(499.8)\ (Y_m)\ (V_m)\ (P_{bar})} \qquad \text{Eq. 306A-2}$$

where:

M_{cr} = Amount of Cr in sample from Method 306, Eq. 306-1, Hg.

T_m = Dry gas meter temperature, °F.

Y_m = Dry gas meter correction factor, dimensionless.

V_m = Dry gas meter volume, ft3.

P_{bar} = Barometric pressure, in. Hg.

Approximate Mass Emission Rate (Optional)

Calculate an approximate mass emission rate of Cr in kg/hr using the following equation:

$$kg/hr = (0.0001597)\ (C_{cr})\ (r^2)\ (\sqrt{\Delta p})\ avg \sqrt{\frac{(T_s + 460)}{(P_{bar})\ (28.73)}} \qquad \text{Eq. 306A-3}$$

Where:

r	=	Radius of stack, in.
$(\sqrt{\Delta p})_{avg}$	=	Average of $\sqrt{\Delta p}$ values.
T_s	=	Stack temperature, °F.
P_{bar}	=	Barometric pressure, in. Hg.
C_{cr}	=	Concentration of Cr, mg/dscm.

NOTE: The emission rate calculated using Equation 306!-3 is based on an assumed moisture content of 2%.

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APPENDIX IV

FIELD DATA SHEETS

March 17, 1998

Court Metal Finishing
14,000 CFM System
Pressure Drop Observed on Chromax During Test

Stage 1	1.00" H_2O
Stage 2	1.88" H_2O
Stage 3	.3" H_2O
OVER ALL	2.8" H_2O

Plant COURT METAL FINISHING
Date 2-23-98 Time 10:25
Location FLINT MICH.
Operator(s) DAVID BURCHAM,
Begining stack temperature, °F 80.6
Ending stack temperature, °F 82.5
Average stack temperature, °F 81.55
14 K SYSTEM
Circle one:

Schematic of Points

Before Run 1 Before Run 2 Before Run 3 After Run No.

LEFT

Traverse Point Number	Cyclonic Flow Angle (Degrees)	Δp	$\sqrt{\Delta p}$	$\frac{\sqrt{\Delta p} \times 5 \text{ min}}{(\sqrt{\Delta p})}$ = Nuthorical Minutes	Decimal Part of Minute x 60 = Seconds	Whole Minutes + Seconds = Sample Time
1	15°	.78	.883	4.873	52.38	4.52
2	20°	.91	.953	5.259	15.54	5.15
3	27°	.98	.989	5.458	27.48	5.27
4	25°	.95	.974	5.375	22.50	5.22
5	25°	.92	.959	5.292	17.52	5.17
6	25°	.80	.894	4.933	55.98	4.55
7	5°	.53	.728	4.017	01.02	4.01
8	12°	.68	.824	4.547	32.82	4.32
9	15°	.81	.900	4.966	57.96	4.57
10	18°	.93	.964	5.320	19.20	5.19
11	17°	1.01	1.004	5.540	32.40	5.32
12	20°	.80	.894	4.933	55.98	4.55

RIGHT

1	15°	.63	.793	4.376	22.56	4.22
2	22°	.65	.806	4.448	26.88	4.26
3	32°	.67	.818	4.514	30.84	4.30
4	25°	.61	.781	4.310	18.60	4.18
5	18°	.52	.721	3.979	58.74	3.58
6	15°	.43	.655	3.614	36.84	3.36
7	5°	.82	.905	4.994	59.54	4.59
8	9°	1.05	1.024	5.651	39.06	5.39
9	8°	1.12	1.058	5.838	50.28	5.50
10	8°	1.20	1.095	6.043	02.58	6.02
11	10°	1.25	1.118	6.169	10.14	6.10
12	10°	1.03	1.014	5.596	35.76	5.35
	Avg 16.708		Avg .906			

Figure 306A-2. Velocity Traverse and Point Sample Time Calculation Sheet.

Figure 306A-3. Chromium Constant Sampling Rate Field Data Sheet

Plant Court Metal Finishing
Sampling Site Roof
Total Cr catch, M_{cr}, µg
Avg dry gas meter temp, T_m, °F 89.1
Meter correction factor, Y_m 1.000
Meter volume, V_m, ft³ 68.704
Barometric press, P_{bar}, in. Hg 30.00
Start clock time 16:58
Stop clock time 20:01

Date 2-23-98 Run Number 02
Operator DAVID BURCHAM
Stack Radius, r, in 15"
Avg sq. rt. Δp, $(\sqrt{\Delta p})_{avg}$, in. H_2O .906
Stack temp, T_s, °F 82.2 / 79.9
Leak rate before run, cfm < .005
Leak rate after run, cfm < .005
Stop meter volume, ft³ 836.104
Start meter volume, ft³ 767.400

REMARKS: 14 K SYSTEM

LEFT

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)
1	4.52	93°
2	5.15	92°
3	5.20	93°
4	5.22	93°
5	5.17	92°
6	4.55	93°
7	4.01	93°
8	4.32	93°
9	4.57	94°
10	5.19	97°
11	5.32	100°
12	4.55	102°

RIGHT

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)
1	4.22	72°
2	4.26	71°
3	4.30	72°
4	4.18	74°
5	3.58	76°
6	3.36	80°
7	4.59	86°
8	5.39	90°
9	5.50	93°
10	6.02	95°
11	6.10	97°
12	5.35	98°

$$C_{cr} = \frac{(M_{cr})(T_m + 460)}{(499.8)(Y_m)(V_m)(P_{bar})}$$

$$kg/hr = (C_{cr})(0.0001597)(r^2)(\sqrt{\Delta p})_{avg}\sqrt{\frac{(T_s + 460)}{(P_{bar})(28.73)}}$$

mg/cubic meter, (C_{cr}) _____ (Optional) kg/hr _____

89.12.5

Figure 306A-3. Chromium Constant Sampling Rate Field Data Sheet

Plant Court Metal Finishing
Sampling Site Roof
Total Cr catch, M_{cr}, µg
Avg dry gas meter temp, T_m °F 97.8
Meter correction factor, Y_m 1.000
Meter volume, V_m ft³ 69.285
Barometric press, P_{bar} in. Hg 30.00
Start clock time 20:39
Stop clock time 22:52

Date 2-23-98 Run Number 03
Operator David Buechner
Stack Radius, r, in. 15"
Avg sq. rt. Δp, $(\sqrt{\Delta p})_{avg}$ in. H_2O .906
Stack temp, T_s, °F 79.0 / 79.7
Leak rate before run, cfm < .005
Leak rate after run, cfm < .005
Stop meter volume, ft³ 906.385
Start meter volume, ft³ 837.100

REMARKS: 14 K System

LEFT

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)
1	4.52	88°
2	5.15	89°
3	5.27	90°
4	5.22	92°
5	5.17	93°
6	4.55	94°
7	4.01	95°
8	4.32	96°
9	4.57	98°
10	5.19	99°
11	5.32	100°
12	4.55	100°

RIGHT

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)
1	4.22	100°
2	4.26	100°
3	4.30	100°
4	4.18	100°
5	3.58	100°
6	3.36	100°
7	4.59	101°
8	5.39	102°
9	5.50	103°
10	6.02	103°
11	6.10	103°
12	5.35	103°

$$C_s = \frac{(M_{cr})(T_m + 460)}{(499.8)(Y_m)(V_m)(P_{bar})}$$

$$kg/hr = (C_s)(0.0001597)(r^2)(\sqrt{\Delta p})_{avg}\sqrt{\frac{(T_s + 460)}{(P_{bar})(28.73)}}$$

mg/cubic meter, (C_s) _____ (Optional) kg/hr _____

Figure 306A-3. Chromium Constant Sampling Rate Field Data Sheet

Plant: Court Metal Finishing
Sampling Site: Roof
Total Cr catch, M_{cr}, µg: _____
Avg dry gas meter temp, T_m, °F: 82.3
Meter correction factor, Y_m: 1.000
Meter volume, V_m, ft³: 68.303
Barometric press, P_{bar}, in. Hg: 30.00
Start clock time: 13:45
Stop clock time: 15:55

Date: 2-23-98 Run Number: 01
Operator: David Burcham
Stack Radius, r, in: 15"
Avg sq. rt. Δp, $(\sqrt{\Delta p})_{avg}$, in. H_2O: .906
Stack temp, T_s, °F: 83.7 / 82.8
Leak rate before run, cfm: < .005
Leak rate after run, cfm: < .005
Stop meter volume, ft³: 766.503
Start meter volume, ft³: 698.200

REMARKS: 14 K system

Left

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)
1	4.52	80°
2	5.15	80°
3	5.27	81°
4	5.22	81°
5	5.17	81°
6	4.55	81°
7	4.01	81°
8	4.32	82°
9	4.57	83°
10	5.19	84°
11	5.32	84°
12	4.55	84°

Right

POINT NO.	SAMPLE (MIN/SEC)	GAS METER TEMP (°F)
1	4.22	83°
2	4.26	83°
3	4.30	84°
4	4.18	84°
5	3.58	84°
6	3.36	84°
7	4.59	84°
8	5.39	83°
9	5.50	82°
10	6.02	82°
11	6.10	81°
12	5.35	81°

$$C_{cr} = \frac{(M_{cr})(T_m + 460)}{(499.8)(Y_m)(V_m)(P_{bar})}$$

$$kg/hr = (C_{cr})(0.0001597)(r^2)(\sqrt{\Delta p})_{avg}\sqrt{\frac{(T_s + 460)}{(P_{bar})(28.73)}}$$

mg/cubic meter, (C_{cr}) _____

(Optional) kg/hr _____

APPENDIX V

SAMPLE ANALYSIS SHEETS

$$\frac{(M_{CR})\,(T_M + 460)}{(499.8)\,(LY_M)\,(V_M)\,(P_{BAR})}$$

RUN #1: $\frac{(14.2)\,(82.3 + 460)}{(499.8)\,(1.000)\,(30)\,(68.303)} = .0075$

RUN #2 $\frac{(10.7)\,(89.1 + 460)}{(499.8)\,(1.000)\,(30)\,(68.704)} = .0057$

RUN #3 $\frac{(8.9)\,(97.8 + 460)}{(499.8)\,(1.000)\,(30)\,(69.285)} = .005$

AVERAGE = .006

Environmental Consultants, Inc.

391 Newman Avenue Clarksville, Indiana 47129 812 282 8481 FAX: 812 282 8554

For Lab Use Only
ECI #:
Client #:

Chain of Custody Record

Client:	Client Contact:
Address:	Phone: FAX:
City, State, Zip	PO # / Project #:

Sample Location / ID	Sample Matrix	Sample Date	Collection Time	Grab (G) Comp.(C)	No. of Containers	Tests Requested
5510						5336
#1 14.2 U.9.						#1 29.6 U.9.
#2 10.7 U.9.						#2 22.7 U.9.
#3 8.9 U.9.						#3 27.6 U.9.
#4 BLANK - 7.3						#4 BLANK - 9.8
COURT METAL						KOTO GAV. S&M
FLINT, MI.						NEW BERLIN, WI.

Sampler Signature:	Date:	Time:	Remarks:
Relinquished By:	Date:	Time:	
Lab Signature:	Date:	Time:	

FORM 8/95

Environmental Consultants, inc.
Professional Laboratory Services

Vanaire
10151 Bunsen Way
Louisville, KY 40299
ATTN: Mr. Mike Vanegas

Report Date: 03/06/98
Client Code: 007776

P.O. No.: 00-09097

Released By:

Matrix: Impinger Solution
Collection Date: 02/23/98

Sample Type: Grab
Collected By: D. B.

Date Received: 03/02/98
Time Sampled: 1345

COMMENTS:

Lab Control Range: 301623 Through 301625 Sample Location: See Below

ANALYSIS	RESULT	UNITS	DET. LIMIT	ANALYST	DATE ANALYZED	ANALYTICAL METHOD
E.C.I. # 301623 5510, #1						
Chromium, total	14.2	ug	1.	TLH	03/04/98	EPA 306
E.C.I. # 301624 5510, #2						
Chromium, total	10.7	ug	1.	TLH	03/04/98	EPA 306
E.C.I. # 301625 5510, #3						
Chromium, total	8.9	ug	1.	TLH	03/04/98	EPA 306

Environmental Consultants, inc.
Professional Laboratory Services

Vanaire
10151 Bunsen Way
Louisville, KY 40299
ATTN: Mr. Mike Vanegas

Report Date: 03/06/98
Client Code: 007776

P.O. No.: 00-09097

Released By:

Matrix: Impinger Solution
Collection Date: 02/28/98

Sample Type: Grab
Collected By: D. D.

Date Received: 03/02/98
Time Sampled: 1130

COMMENTS:

Lab Control Range: 301642 Through 301643 Sample Location: See Below

ANALYSIS	RESULT	UNITS	DET. LIMIT	ANALYST	DATE ANALYZED	ANALYTICAL METHOD
L.C.I. # 301642						
5510, Blank						
Chromium, total	7.3	ug	1.	TLH	03/04/98	EPA 306
L.C.I. # 301643						
5336, Blank						
Chromium, total	9.8	ug	1.	TLH	03/04/98	EPA 306

Environmental Consultants, inc.

Professional Laboratory Services

Prepared 03/05/98

QUALITY CONTROL NARRATIVE
LEVEL 1

The QC data presented in this report has been reviewed for compliance In accordance with the Environmental Consultants, Inc. QA/QC program. All QC data has been found to be within established control limits and/or requirements with the exception of those items noted below. Exceptions are noted for each item.

The following items are included in this report for the period: 03/05/98 to 03/05/98

1. Blank Results: All blank results are reported for the referenced period.

   Exception: NONE

2. Duplicate Results: All duplicate results are reported for the referenced period. Please note that samples are randomly elected at required frequencies for each matrix type and may not be performed upon the sample submitted.

   Exception: NONE

3. Matrix Spike Results: All spike results are reported for the referenced period. Please note that samples are randomly selected at required frequencies for each matrix type and may not be performed upon the sample submitted.

   Exception: NONE

4. Reference Standard Results: All results are reported for the referenced period.

   Exception: NONE

Reviewer: [signature] Title: QA/QC Coordinator Date: 3/6/98

Released by: [signature] Title: PRESIDENT Date: 3/6/98

Prepared For: Vanaire

Environmental Consultants, inc.
Professional Laboratory Services

Duplicate Analysis
ECI No. 301623 to 301628 and 301642 to 301643

Parameter	Batch Number	Sample Result (ug)	Duplicate Result (ug)	RPD	Minimum Control Limit	Maximum Control Limit
Chromium, total	103420	14.2	15.7	10	0	20

Method Blank Analysis
ECI No. 301623 to 301628 and 301642 to 301643

Parameter	Batch Number	Detection Limit	Result (mg/L)	Minimum Control Limit	Maximum Control Limit
Chromium, total	103420	0.001	<0.001	0	0.001

Matrix Spike Analysis
ECI No. 301623 to 301628 and 301642 to 301643

Parameter	Batch Number	Sample Result (ug)	Spiking Level (ug)	Spiked Sample Result (ug)	Percent Recovery	Minimum Control Limit	Maximum Control Limit
Chromium, total	103420	14.2	7.3	21.462	99.5	80	120

Reference Standard Analysis
ECI No. 301623 to 301628 and 301642 to 301643

Parameter	Batch Number	Standard Level (mg/L)	Result (mg/L)	Minimum Control Limit	Maximum Control Limit
Chromium, total	103420	0.01	0.01	0.0082	0.0112

BEFORE SAMPLES
VANAIRE EMISSION CALIBRATION SHEET

10 MINUTE RUN TIME

DATE: 2-23-98

OPERATOR: DAVID BURCHAM

PLANT: COURT METAL FINISHING

LOCATION: ROOF - FLINT, MI

DRY GAS METER MODEL NO.: 175S

SERIAL NO.: 30630

SCRUBBER MODEL NO.: CH-1

SERIAL NO.: E51617

FAN MODEL NO.: VC 660

SERIAL NO.: K51687

START MOTOR VOL.: 690.000

STOP METER VOL.: 697.5008

METER VOLUME: 7.5008

GAS METER TEMP. START: 81°

STOP: 79°

GAS METER CORRECTION FACTOR: 1.000

IN. HG. VAC.: 17.5

BAROMETRIC PRESSURE: 30.00

OUTSIDE TEMP.: 38°

COMMENTS:

_____

_____

_____

_____

AFTER SAMPLES
VANAIRE EMISSION CALIBRATION SHEET

10 MINUTE RUN TIME

DATE: 2-23-98

OPERATOR: DAVID BURCHAM

PLANT: COURT METAL FINISHING

LOCATION: ROOF - FLINT, MI

DRY GAS METER MODEL NO.: 175S

SERIAL NO.: 30630

SCRUBBER MODEL NO.: CII-1

SERIAL NO.: E51617

FAN MODEL NO.: VC 660

SERIAL NO.: K51687

START MOTOR VOL.: 907.105

STOP METER VOL.: 914.773

METER VOLUME: 7.668

GAS METER TEMP. START: 84°

STOP: 82°

GAS METER CORRECTION FACTOR: 1.000

IN. HG. VAC.: -16.5

BAROMETRIC PRESSURE: 30.00

OUTSIDE TEMP.: _____

COMMENTS:

_____

_____

_____

_____

ATTACHMENT C

MSDS Master List

TABLE 1. MSDS MASTER LIST FOR TED JURACSIK TOOL & DIE

255 N. Congress Avenue, Delray Beach, Florida 33445

STATUS	CHEMICAL NAME	VENDOR
ACTIVE	ALOXIDE	BIRCHWOOD CASEY
ACTIVE	ALUMINUM BLACK BK SUPER POWDER	CLARIANT CORPORATION
ACTIVE	ALUMINUM FAST GOLD L POWDER	CLARIANT CORPORATION
ACTIVE	ANODAL CLEANER NFO POWDER	CLARIANT CORPORATION
ACTIVE	ANODAL DEOX LFN LIQUID	CLARIANT CORPORATION
ACTIVE	ANODAL ETCH ADDITIVE LG LIQUID	CLARIANT CORPORATION
ACTIVE	CAUSTIC SODA, 50% LIQUID	ASHLAND CHEMICAL
ACTIVE	CHEMTROL 409	PRECISION FINISHING, INC
ACTIVE	CHROMATE YELLOW #2 POWDER	CLARIANT CORPORATION
ACTIVE	CLEAR AMBER LIQUID	JACKSONLEA
ACTIVE	NITRIC ACID, 42^0 AND 42^0	ASHLAND CHEMICAL
ACTIVE	SULFURIC ACID, 66^0	ASHLAND CHEMICAL
ACTIVE	UNSATURATED POLYESTER RESIN SILICA	PLASTIC TUMBLING MEDIA

[redacted] JU[redacted]CSI[redacted]DO[redacted]DIE[redacted]C.

ANODIZING PROCESS LINE
20/4489/D

SPECIFICATION CHART

TREATMENT NUMBER & DESCRIPTION	# OF STAT	TIME MIN.	TANK LENGTH	TANK WIDTH D.O.T.	TANK DEPTH	TANK VOL GALLONS 6" S/L	MAT. OF CONST.	OVER FLOW	BOT. DRAIN	DIS-CHARGE TO	HEAT/ COOLING	FILTER	VENT	RECTIFIER	AGI-TATION	RINSE TANK CTRL.
SOAK CLEAN	1	1-5	60"	36"	42"	336	PP			CAK	150° F		X			
ETCH CLEAN	2	1-5	60"	36"	42"	336	PP			CA	150° F		X			
RINSE	3	1	60"	30"	42"	280	PP	X		AA					A	X
DEOXIDIZE	4	1-3	60"	30"	42"	280	PP			CA			X		A	
CF RINSE	5-6	1	60"	64"	42"	598	PP	X		AA					A	X
IRIDITE #1	7	1-3	60"	30"	42"	280	PP			CR					A	
IRIDITE #2	8	1-3	60"	30"	42"	280	PP			CR					A	
CF RINSE	9-10	1	60"	64"	42"	598	PP	X		AA					A	X
ANODIZE	11	20-30	60"	60"	42"	561	PP				70° F	X	X	24V 1500A	A	
RINSE	12	1	60"	30"	42"	280	PP	X		AA					A	X
NEUTRALIZE	13	½	60"	30"	42"	280	PP			CAK					A	
RINSE	14	1	60"	30"	42"	280	PP	X		AA					A	X
BLACK DYE	15	½-20	60"	36"	42"	336	PP			CA	150° F		X			
CF RINSE	16-17	1	60"	64"	42"	598	PP	X		AA					A	X
NICKEL ACETATE SEAL	18	4	60"	36"	42"	336	SS-I			CA	210° F		X			
HOT WATER SEAL	19	11	60"	36"	42"	336	SS-I			AA	210° F		X			

DEFINITIONS

CFR - COUNTERFLOW
S - MILD STEEL
SS - STAINLESS STEEL
P - PVC
DOT - DIRECTION OF TRAVEL
WT - WASTE TREATMENT

FG - FIBERGLASS
OS - OUTSIDE
C - COPPER
T - TITANIUM
A - AIR AGITATION
U - ULTRASONIC

PP - POLYPROPYLENE
BR - BRONZE
CS - COATED STEEL
L - LEAD LINED
M - MECHANICAL AGITATION

OD - OUTSIDE DIAMETER
IN - INSIDE
D - DERATED
SL - SOLUTION AGITATION
I - INSULATED
CR - CHROME

AA - ACID ALKALI
CN - CYANIDE
CA - CONCENTRATED ACID
CAK - CONCENTRATED ALKALI
PVDF - KYNAR™
PTFE - TEFLON™

[redacted] JURACSIK TOOL & DIE, INC.

OFF LINE DYE & SEAL

20/4489/D

SPECIFICATION CHART

TREATMENT NUMBER & DESCRIPTION	# OF STAT	TIME	TANK LENGTH	TANK WIDTH D.O.T.	TANK DEPTH	TANK VOL GALLONS 6" S/L	MAT. OF CONST.	OVER FLOW	BOT. DRAIN	DIS-CHARGE TO	HEAT/ COOLING	FILTER	VENT	RECTIFIER	AGI-TATION	RINSE TANK CTRL.
GOLD DYE	1		24"	24"	42"	90	PP			CA	150° F		X			
NICKEL ACETATE SEAL	2		24"	24"	42"	90	SS-I			CA	210° F		X			
CF RINSE	3-4		24"	51"	42"	190	PP	X		AA					A	X
HARD COAT ANODIZE	5		36"	24"	42"	135	PP						X			

DEFINITIONS

CFR - COUNTERFLOW
S - MILD STEEL
SS - STAINLESS STEEL
P - PVC
DOT - DIRECTION OF TRAVEL
WT - WASTE TREATMENT

FG - FIBERGLASS
OS - OUTSIDE
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OD - OUTSIDE DIAMETER
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AA - ACID ALKALI
CN - CYANIDE
CA - CONCENTRATED ACID
CAK - CONCENTRATED ALKALI
PVDF - KYNAR™
PTFE - TEFLON™

SECTION 2.0

VENTILATION SECTION

SECTION 2.0 - VENTILATION SECTION

2.1 - Exhaust System: 17,056 CFM at 4" S.P.

1. P.V.C. type H-3 hoods with drip shields. (10) required.
2. One (1) lot PVC ductwork.
3. PVC HF-130 Horizontal Scrubber with self contained recirculation system.
4. PVC HF-130 inlet and outlet transitions.
5. PVC Model VC-730 fan with 20 hp motor including inlet flex connector.
6. PVC VC-730 outlet transition.
7. PVC 32" exhaust stack with butterfly stack cap.
8. PVC push system with VCI-8 fan with 5 h.p. motor, valves, headers, and necessary duct work.

SECTION 2.0 - VENTILATION EQUIPMENT

2.2 - Ductwork Systems

This PVC duct system will be fabricated in accordance with the specifications set forth by the SMACNA Manual on thermoplastic construction. This system will be fabricated from 3/16" Type I extruded PVC (conforming to ASTM-D-1784-69) in diameters 6" through 24', and 3/16" and 1/4" high impact Type II PVC sheet stock (conforming to ASTM-D-1927-67) in diameters greater than 24". All elbows and fittings less than 20" are butt-welded on a special butt-welder for fittings, to ensure fitting leakproof. All straight duct sections greater than 24" are longitudinally butt-welded to guarantee the weld at 100% of the material strength. All systems are designed in accordance with the manuals of recommended practice set forth by the American Conference of Governmental Industrial Hygienists (ACGIH), and the American National Standard Institute (ANSI).

All duct thickness and reinforcement is designed based on SMACNA requirements for the static pressure of the system. Duct connections will be by coupling or bell end. Flange connections are available as option if requested.

All welding to be done by welders, trained and certified by the method of hot gas fusion PVC welding. All factory joints are welded with no less than four PVC welds on each joint (three out and one in), to minimize the possibility of leaks. All risers to have blast-gate or locking quadrant dampers.

This system design is based on the following:

Type of hoods - H-3

Number of hoods - Total of ten (10)

Centerline of main trunkline above tanks - approximately 8 ft.

Roof opening by - customer

Roof opening located - by customer

Fans and scrubbers located - on roof

SECTION 2.0 - VENTILATION EQUIPMENT

2.3 - Custom Built Fume Scrubbers By Vanaire

Vanaire designs and manufactures high efficiency low maintenance fume scrubbers to remove water soluble contaminants by means of gas absorption or mechanical impingement. These units can be built in either horizontal (crossflow), or vertical (countercurrent) designs, depending on space limitations or layout preference.

Scrubbers are custom designed, with specific parameters such as cross section, packing type and depth, recirculation rate, spray pattern, and reinforcing being determined based on your exact conditions, the scrubber efficiency required, or the degree of difficulty of the contaminant to be scrubbed.

Scrubbers are constructed to the highest quality standards in the industry and are built for maximum corrosion resistance under the most severe duty conditions.

Scrubbers are manufactured from Type II, high impact PVC, UV stabilized polypropylene, filament wound or hand lay-up solid fiberglass or dual laminate construction (PVC or polypro overlaid with solid fiberglass).

Scrubbers are designed at velocities of 300-500 FPM. Contaminant removal takes place by first slowing the air velocity, then the gas stream passes through an initial spray chamber configured for maximum coverage of the cross section. Spray nozzles are highest quality, solid cone, polypropylene. Spray chambers are easily removed for servicing.

The second scrubber stage consists of high efficiency random packing media, providing up to 68 square feet of contact area and up to 50,000 drip points per cubic foot. Packing beds are kept saturated by means of an overhead spray chamber. Packing depths of 3-5 feet are standard. But custom designed packing depths are available for difficult scrubbing applications.

The final scrubbing stage is mist elimination. It is achieved by high efficiency polypropylene mesh pad, designed to be 99% efficient on particle sizes 5 microns and greater. Other mesh pad configurations can be designed for higher mist elimination efficiency. Mesh pads used in scrubbers are only the highest quality.

Vanaire scrubber recirculation systems can be designed as integral (self contained), or remote tanks can be located inside your building in a heated area to ensure solution freeze protection. The systems incorporate vertical high efficiency corrosion resistant pumps. These pumps contain no bearings or seals and feature CPVC impellers, stainless steel shafts and high efficiency chemical duty motors. Remote tanks are constructed of corrosion resistant PVC, polypropylene, CPVC, or FRP.

SECTION 2.0 - VENTILATION EQUIPMENT

Standard on all scrubbers are fresh water flow meters, wye strainers, quick opening access doors, steel scrubber bases with lifting lugs coated with the highest quality epoxy, stainless steel hardware and neoprene or hypolon gasketing.

2.4 - The Vanaire HF Series Horizontal Scrubber

Vanaire HF (horizontal flow) packed bed scrubber is designed for use when high scrubbing efficiencies are required, and overhead space is limited or when crossflow design is preferred. Standard packing depths are 18" (HF 100), 36" (HF 130), or 60" (HF 150), or pack depth is custom designed based on specific application. Vanaire HF scrubbers can be equipped with either self-contained or remote recirculation systems. Vanaire HF scrubbers are always totally corrosion resistant, and come complete with high efficiency mist eliminator, spray chambers, external piping and connections, wye strainers, flow meter and epoxy coated steel base with lifting lugs.

2.5 - Design Specifications for the Vanaire HF Application

1. Scrubber capacity (CFM) - 17,056
2. Scrubber pressure drop - 2.0"
3. External static pressure - 2.0"
4. Material of construction - PVC
5. Packing depth - 3 ft
6. Packing material - 3.5 Lanpac
7. Mist eliminator - High efficiency mesh pad
8. pH required
9. ORP required - Not quoted
10. Conductivity required - Not quoted
11. Recirculation rate (GPM) - 152
12. Blowdown rate - 1% - 5% of Recirculation System
13. Pump hp - 5
14. Pump voltage - 208v/3ø/60hz
15. Scrubber weight - 4500

SECTION 2.0 - VENTILATION EQUIPMENT

2.6 - Vanaire Model VC Centrifugal Fans

Vanaire VC centrifugal fans are designed and manufactured to be completely corrosion resistant, highly efficient, and feature smooth, quiet operation. These fans are fabricated to the highest quality standards, are rugged, heavy duty, and are designed for high performance under the most severe duty conditions. Each VC fan is complete with coated steel frame, corrosion resistant housing and wheel, OSHA approved belt and shaft guards, TEFC motor, belts and drives, drain, flanged outlet and clean-out door. VC fans are designed and tested in accordance with AMCA standards.

2.7 - Fan Housing

VC fan housings are fabricated from Type II high impact PVC, UV resistant polypro, solid fiberglass, or dual laminate PVC/FRP overlay construction. Standard are OSHA approved shaft guard and belt guard, access door, scroll drain, collared inlet, flanged outlet, close tolerance inlet cones and stainless steel hardware.

2.8 - Fan Wheels

The non-overloading backwardly inclined steel wheel is FRP coated for maximum quality and corrosion resistance. PVC and Kynar wheel coatings and solid fiberglass wheels are also available. These wheels are statically and dynamically balanced to within one mil vibration, peak to peak.

2.9 - Fan Frame

The VC fan frame is comprised of heavy gauge, press broken steel, that is epoxy primed and coated with a two part epoxy paint system for maximum corrosion resistance.

2.10 - Bearings

VC fans are equipped with high quality, heavy duty pillow block bearings that are self aligning, and have an expected average life of 100,000 hours.

2.11 - Motors

All motors on VC fans are high efficient, totally enclosed, fan cooled, and typically operate with 208V, 3 phase, 60 cycle power. Motors are NEMA rated with a 1.15 service factor. Motors are mounted on an adjustable base on side of the V frame for Arrangement #9. Special Arrangement #1 mountings are standard for larger motors, 40 HP and up. Fan is shipped less motor starter and safety disconnect.

SECTION 2.0 - VENTILATION EQUIPMENT

2.12 - Drives

VC fan drives are constant speed, V belt, with 1.15 service factor. Drives contain sufficient grooves for required operation. High capacity belts are also provided. Adjustable drives are available as option.

2.13 - VANAIRE VC FAN SPECIFICATIONS

VC fan number - 730

Material of construction - PVC

Wheel type - Backward Incline

Wheel coating - Fiberglass

Class - II

Arrangement - 9

Rotation - C.W.

Discharge - U.B.

CFM - 17,056

Static pressure - 4.0"

RPM - 972

Brake horse power - 15.00

Motor HP - 20

208 volts 3 phase 60 cycle

Inlet - flex

Fan weight - 1150

Motor weight - 200

SECTION 2.0 - VENTILATION EQUIPMENT

2.14 - VANAIRE VC FAN SPECIFICATIONS - PUSH AIR SYSTEM

VC fan number - 8

Material of construction - PVC

Wheel type - Paddle

Wheel coating - Epoxy

Class - II

Arrangement - 9

Rotation - Clockwise

Discharge - Up-Blast

CFM - 684

Static pressure - 12.0"

RPM - 3228

Brake horse power - 3.00

Motor HP - 5

208 volts 3 phase 60 cycle

Inlet - flex

Fan weight - 170

Motor weight - 70

GEOTECH ENVIRONMENTAL, INC
7488 N.W. 167th Terrace, Miami, FL 33015
Tel: (305) 820 0444 Fax: (305) 820 1244

MEMORANDUM

Date: November 3, 1999

Project No: 029901

To: Ms. Sandy Bowman, Environmental Manager
Florida Department of Environmental Protection
Mail Station 5510
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Tel/Fax: (854) 488 0014

From: Nilesh Lakhlani, GeoTech Environmental, Inc.

Subject: General Air Permit Application for Ted Juracsik Tool & Die, Inc. (TJTD), located at 255 North Congress Avenue, Delray Beach, Palm Beach County, Florida. (0990579)

Pc: Mr. Robert Brewer, Plant Manager, TJTD (561) 272 0770/ 561 272 0441

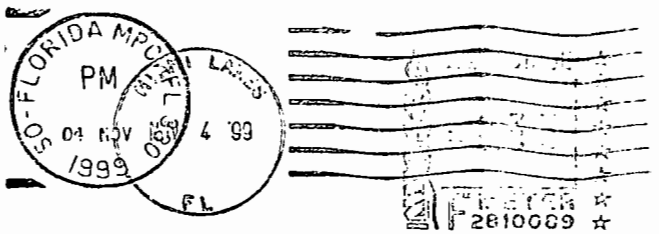
Dear Ms. Bowman:

As discussed with you last week, and at the request of TJTD, GeoTech Environmental, Inc. (GeoTech) is requesting to in-activate the above-mentioned permit recently issued for the subject site. GeoTech has recently learned that the the site is an aluminium anodizing operation using sulfuric acid as an anodizing agent. No hydrogen gas or chromium is utlilized or evolved at the site.

If you have any further questions regarding this memorandum, please do not hesitate to call me at (305) 820 0444.

NL

GEOTECH ENVIRONMENTAL, INC.
P.O. BOX 520641, MIAMI, FL 33015



Ms. Sandy Bowman, Env. Manager
Florida Department of Environmental
ProtectionMail Station 5510
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

32399-6542 01

MISSION INN
GOLF AND TENNIS RESORT

Neil Lakhlani
Geo Tech
(305) 820-0444
Re: Ted
Juracsik

A Mobil ★★★★ Resort Since 1977
10400 County Road 48
Howey-in-the-Hills, Florida 34737

0990579

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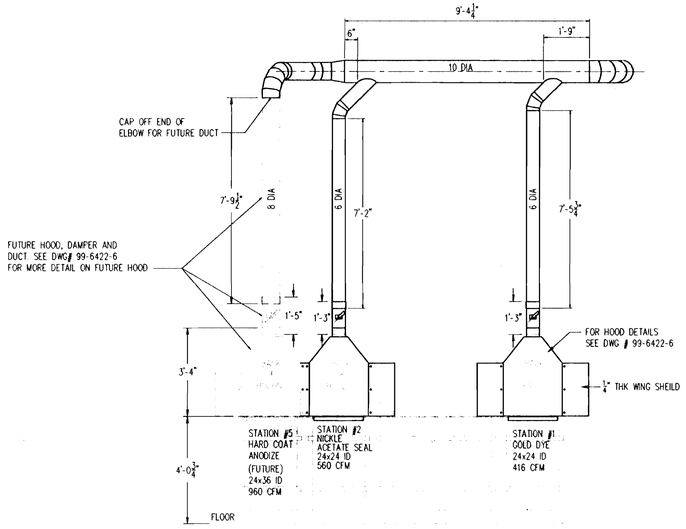
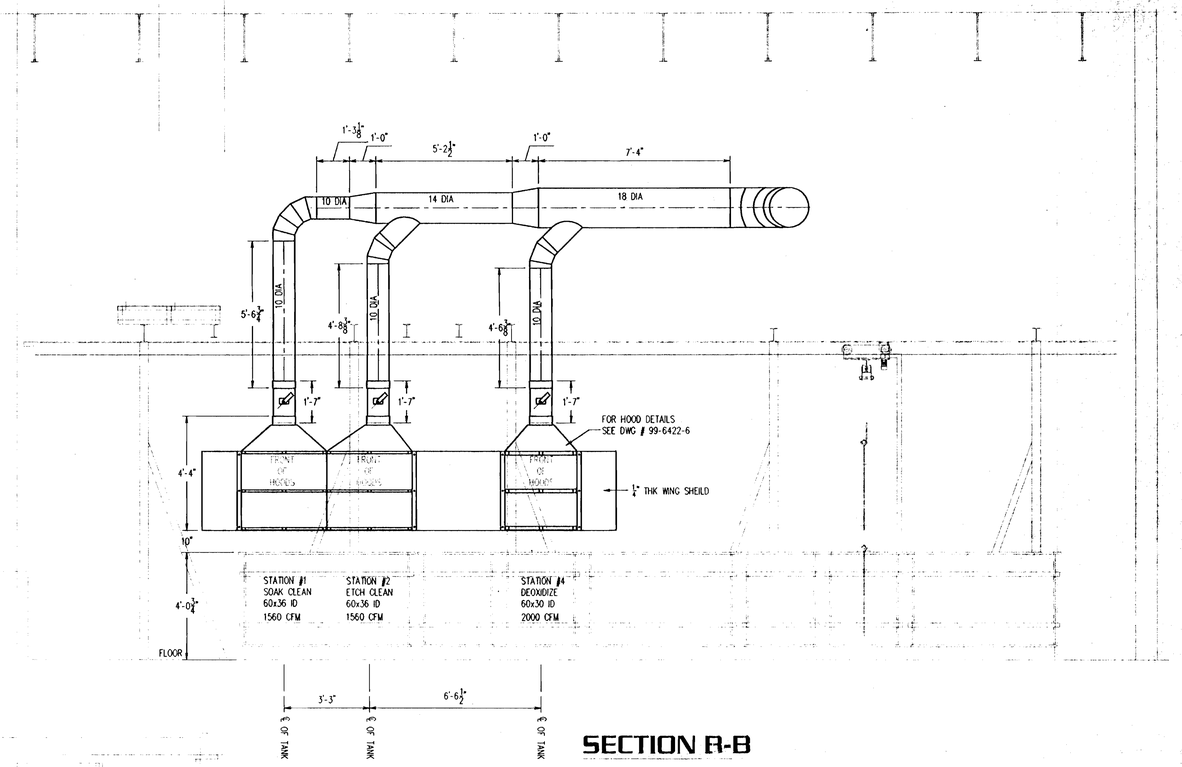
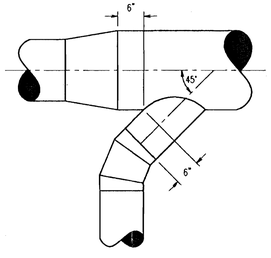


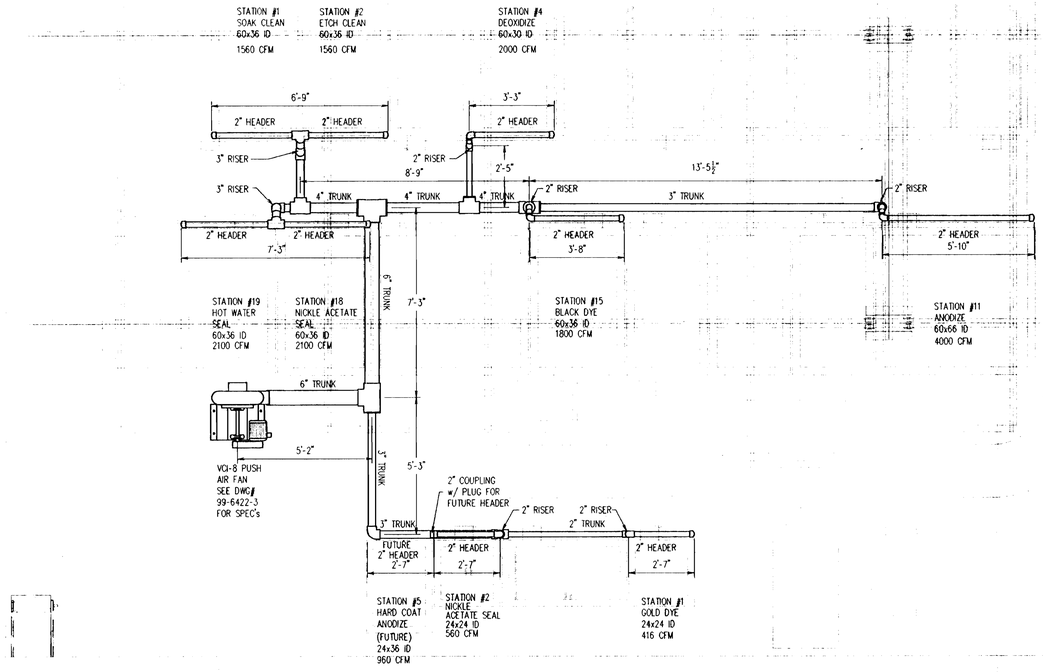
SECTION C-C



SECTION B-B



TYPICAL TAP DETAIL



PLAN VIEW OF PUSH AIR SYSTEM

MATERIAL SPECIFICATION	
PVC TYPE 1	☐
TYPE 2	☐
LT. GRAY	☐
DK. GRAY	☐
WHITE	☐
CPVC	☐
P/P NATURAL	☐
BLACK	☐
WHITE	☐
FRP OVERWRAP	☐
SEE NOTES FOR MATERIAL SPEC	☒

NO.	DATE	BY	DESCRIPTION
1	3-18-99	MM	MOVED TRUNK LINE OVER SMALL HOODS

REVISIONS

VANAIRE
10151 BUNSEN WAY
LOUISVILLE, KY. 40299
(502) 491-3553 (502) 491-5182 (FAX)
DIVISION OF VANCAS ENTERPRISES, INC.

TITLE
17,000 CFM PUSH - PULL VENTILATION SYSTEM
-SECTION B-B-
-SECTION C-C-

BY M.MATTINGLY	DATE 2-8-99	CUSTOMER NCA SYSTEMS, INC	
ENGINEER	DATE		
PROJ. MGR. JDR	DATE 3-10-9	END USER TED JURASSIC TOOL AND DIE	
ESTIMATOR	DATE	P.O.	
W.O. 6422	DRAWING NO. 99-6422-5		REV. 1
SCALE 3/8" = 1'-0"			

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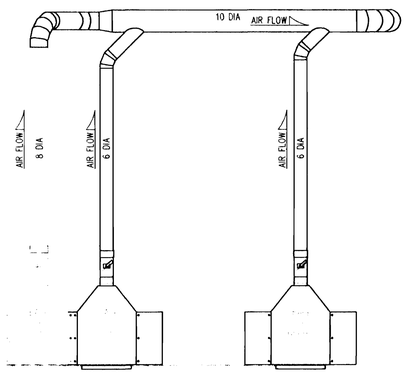
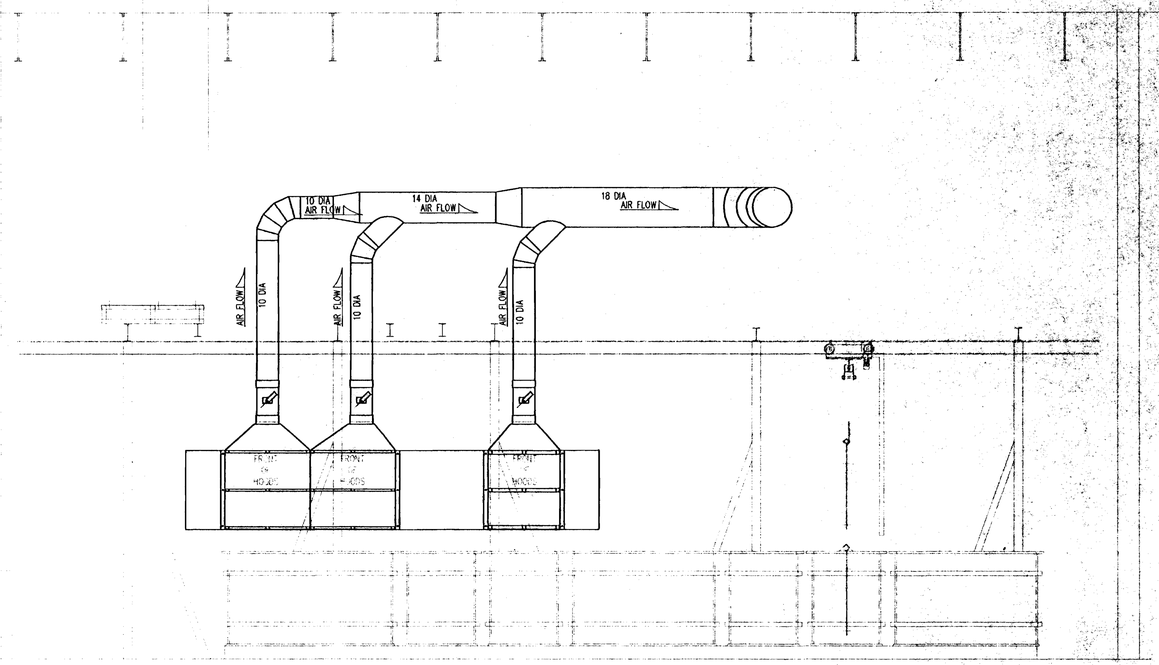
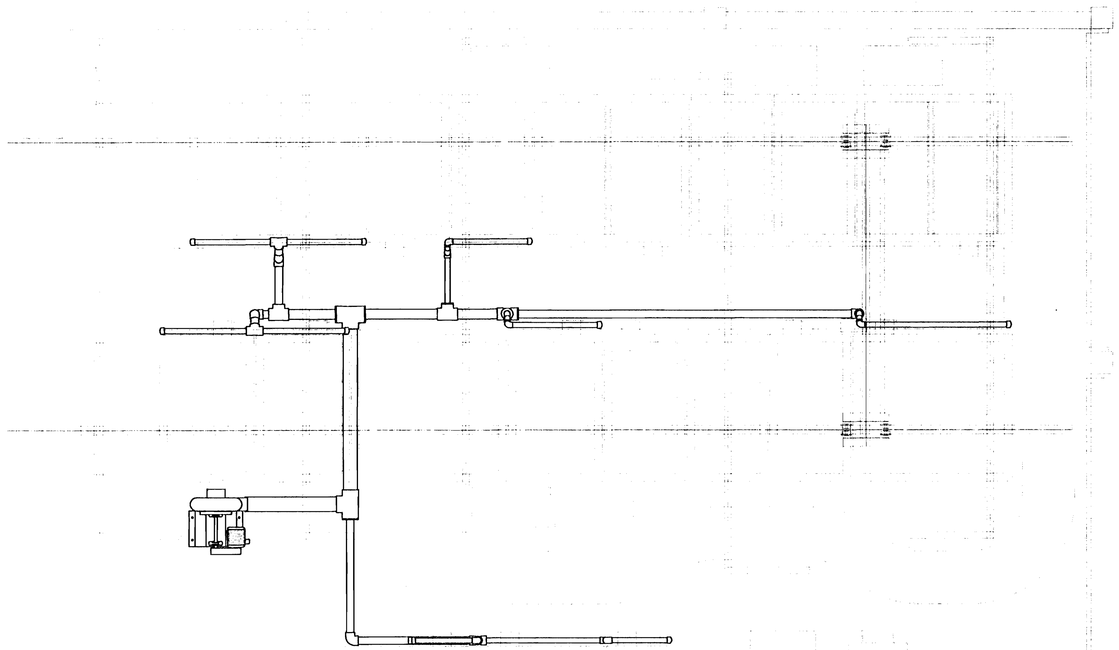
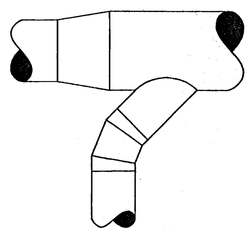








MATERIAL SPECIFICATION	
PVC TYPE 1	☐
TYPE 2	☐
LT. GRAY	☐
DK. GRAY	☐
WHITE	☐
CPVC	☐
P/P NATURAL	☐
BLACK	☐
WHITE	☐
FRP OVERWRAP	☐
SEE NOTES FOR MATERIAL SPEC	☒

NO.	DATE	BY	DESCRIPTION
1	3-18-99	MM	

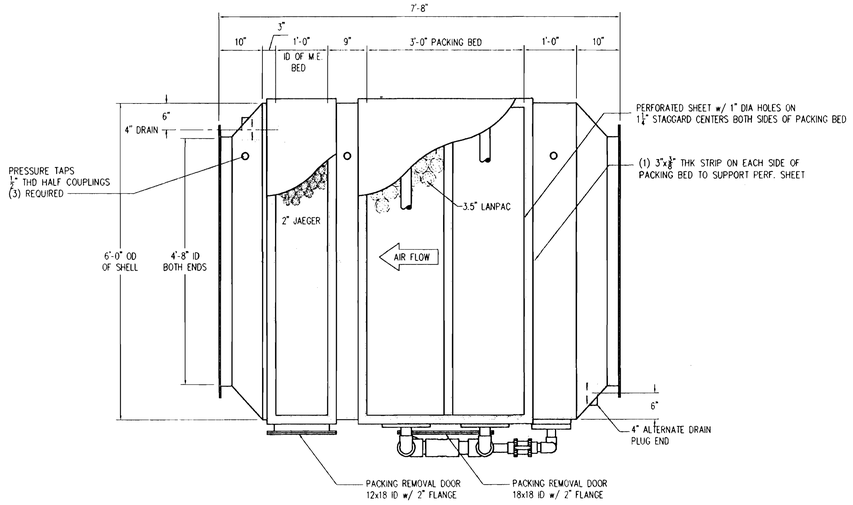
REVISIONS

VANAIRE
(1157) BUNSEN WAY
LOUISVILLE, KY. 40299
(502) 491-1933 - (502) 491-5182 (FAX)
DIVISION OF VORTEX DEVELOPMENT SYSTEMS, INC.

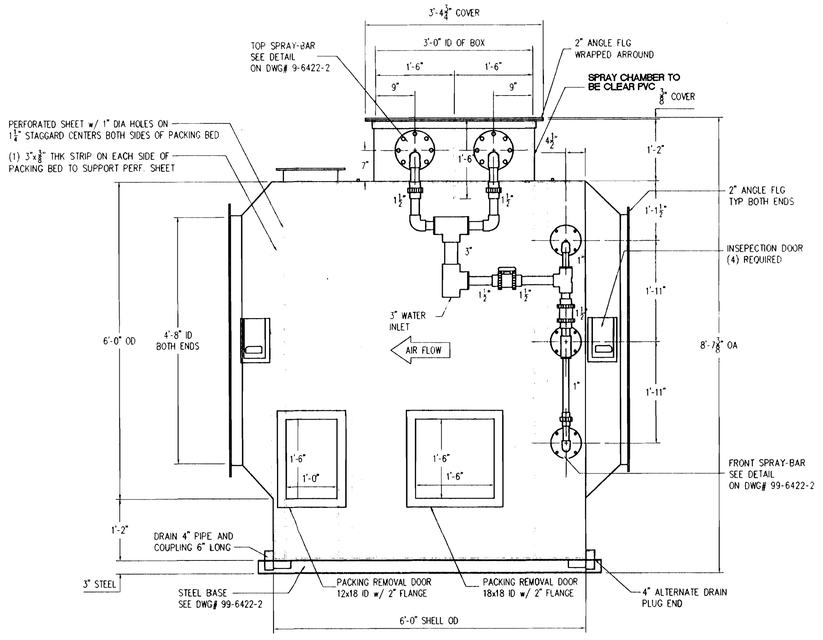
TITLE
17,000 CFM PUSH - PULL
VENTILATION SYSTEM
-SECTION B-B-
-SECTION C-C-

BY M.MATONDLY	DATE 2-8-99	CUSTOMER TOOL SYSTEMS, INC.	
ENGINEER	DATE		
PROJ. MGR.	DATE	END USER TED JURASIC TOOL AND DIE	
ESTIMATOR	DATE	P.O.	
W.O. 6422	DRAWING NO. 99-6422-5		REV. 1
SCALE 3/8" = 1'-0"			

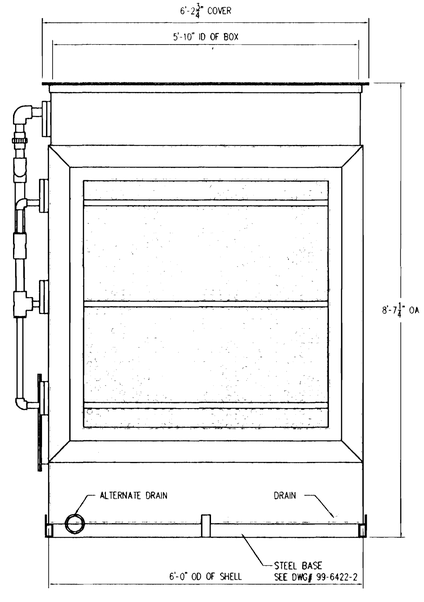
BEST AVAILABLE COPY



PLAN VIEW



ELEVATION VIEW



SIDE ELEVATION VIEW

BILL OF MATERIAL (3)

	NO.	ITEM & MODEL NUMBER	QTY	MATERIAL TYPE	MANUFACTURER	USED FOR
*	1	3" PIPE	AS NEEDED	PVC	ESLON	PIPING
*	2	1½" PIPE	AS NEEDED	PVC	ESLON	PIPING
*	3	1" PIPE	AS NEEDED	PVC	ESLON	PIPING
*	4	1½" PIPE CAP	2	PVC	ESLON	PIPING
*	5	1" PIPE CAP	3	PVC	ESLON	PIPING
*	6	1" 90° ELBOW	2	PVC	ESLON	PIPING
*	7	1½" 90° ELBOW	4	PVC	ESLON	PIPING
*	8	1½" TEE	2	PVC	ESLON	PIPING
*	9	3" TEE	2	PVC	ESLON	PIPING
*	10	1½" UNION	3	PVC	ESLON	PIPING
*	11	1" UNION	1	PVC	ESLON	PIPING
*	12	1½" BALL VALVE	1	PVC	ESLON	PIPING
*	13	1½" x 1" REDUCER BUSHING	2	PVC	ESLON	PIPING
*	14	3" x 1½" REDUCER BUSHING	3	PVC	ESLON	PIPING
*	15	3" FULL COUPLING	1	PVC	ESLON	DRAIN
	16	SPRAY NOZZLE (HHSJ-30-150)	9	PVC	SPRAY SYSTEMS	SPRAYBAR
	17	SPRAY NOZZLE (HHSJ-120-150)	8	PVC	SPRAY SYSTEMS	SPRAYBAR
	18	7"x9" INSPECTION DOOR	4	PVC	VANAIRE FABRICATED	INSPECTION DOOR
	19	2" ANGLE	AS NEEDED	PVC		FLANGES
	20	3" ANGLE	AS NEEDED	PVC		FLANGES
	21	⅜" THK SHEET	AS NEEDED	PVC		SCRUBBER BODY
	22	1" THK SHEET	AS NEEDED	PVC		SPRAYBAR FLGS
	23	PERFORATED SHEET (1" DIA HOLES ON 1¼" STGRD CENTERS)	AS NEEDED	PVC		PACK BED
	24	3.5" LANPAC	AS NEEDED	POLYPRO	LANTEC	PACK BED
	25	2" JAEGER	AS NEEDED	POLYPRO	LANTEC	PACK BED
	26	3 x 4.1 CHANNEL	AS NEEDED	STEEL	SCANSTEEL	BASE
	27	3 x 3 x ⅜ ANGLE	AS NEEDED	STEEL	SCANSTEEL	BASE
	28	6 x 2 x ¼ TABS	8	STEEL	SCANSTEEL	BASE
	29					
	30					
	31					
	32					
	33					

* SCHEDULE 80

MATERIAL SPECIFICATION

PVC TYPE 1
TYPE 2 ☒
LT. GRAY ☐
DK. GRAY ☒
WHITE ☐
CPVC ☐

P/P NATURAL ☐
BLACK ☐
WHITE ☐

FRP OVERWRAP ☐

SCRUBBER BODY THICKNESS — ⅜"

NO.	DATE	BY	DESCRIPTION
2	1-9-99	MM	CHANGED LOCATION AND SIZE OF DRAIN
1	1-23-99	MM	ADDED BILL OF MATERIAL

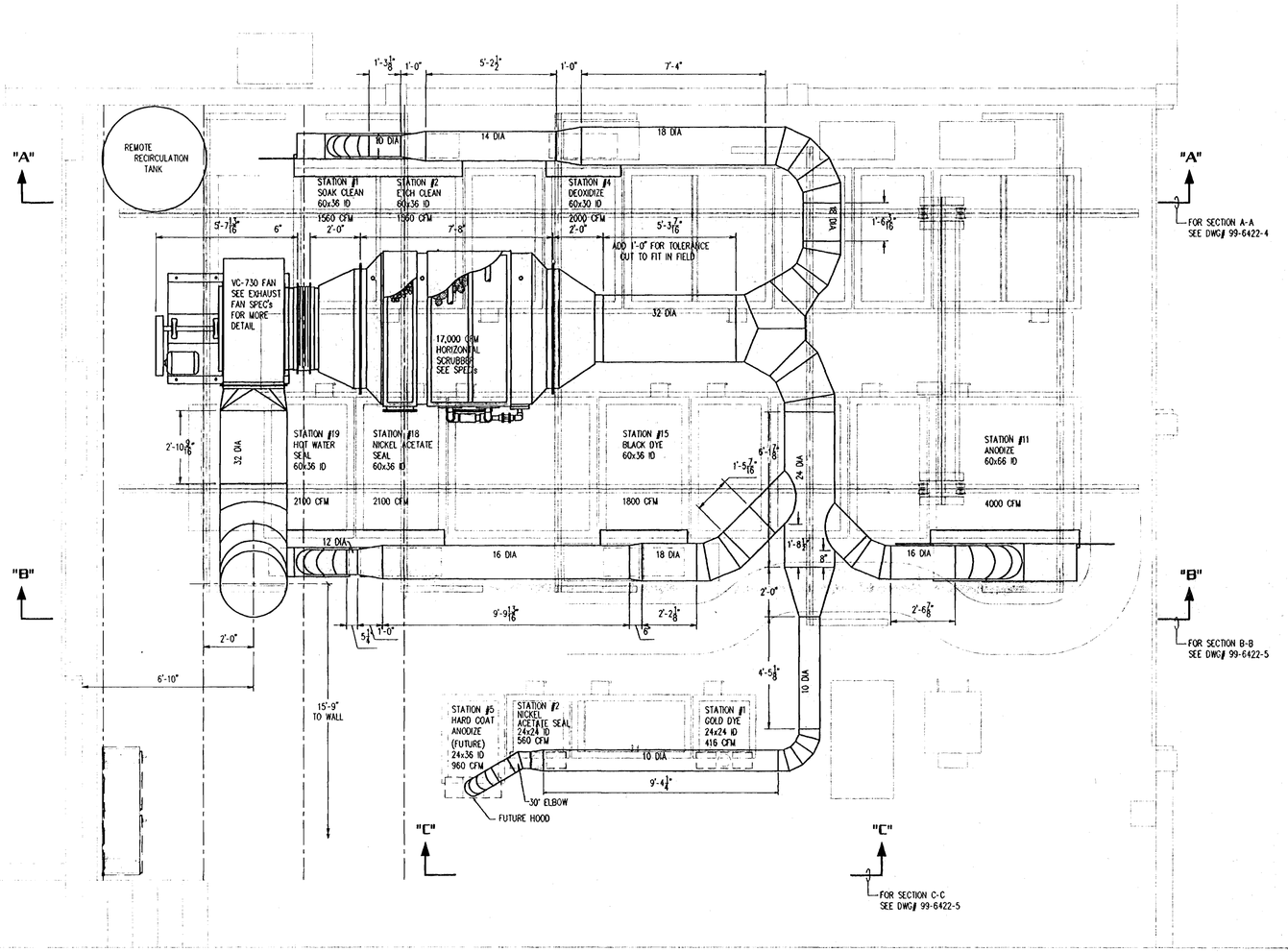
REVISIONS

VANAIRE
10151 BUNSEN WAY
LOUISVILLE, KY. 40299
(502) 491-3553 (502) 491-5182 (FAX)
DIVISION OF VANEAS ENTERPRISES, INC.

TITLE
17,000 CFM OPP. HAND HORIZONTAL SCRUBBER w/ REMOTE RECIRCULATION SYSTEM
HF-131

BY M.MATTINGLY	DATE 12-22-98	CUSTOMER NCA SYSTEMS	
ENGINEER	DATE 2-25-99		
PROJ. MGR.	DATE	END USER TED JURACSIK TOOL & DIE	
ESTIMATOR	DATE	P.O.	
W.O. 6422		DRAWING NO. 99-6422-1	REV. 2
SCALE 3/4" = 1'-0"			

BEST AVAILABLE COPY



PLAN VIEW OF EXHAUST DUCT

GENERAL NOTES

1. VANAIRE SHALL PROVIDE THE FOLLOWING EQUIPMENT
   - (10) H-3 PVC HOODS
   - LOT OF DUCTWORK
   - 17,000 CFM HORIZONTAL SCRUBBER
   - SCRUBBER INLET AND OUTLET TRASITIONS
   - VC-730 EXHAUST FAN w/ 20 HP MOTO AND INLET FLEX CONNECTOR
   - VC-730 OUTLET TRASITION
   - 32" DIA STACK w/ BUTTERFLY CAP AND RAIN SKIRT
   - VCI-8 PUSH AIR FAN w/ 5 HP MOTOR
   - PUSH AIR PIPING, VALVES AND HEADERS AS NEEDED
2. INSTALLATION OF ALL EQUIPMENT STATED IN NOTE 1 SHALL BE PROVIDED BY VANAIRE PERSONNEL
3. ALL PVC INSIDE OF BUILDING MAY BE DARK GRAY PVC, BUT ANY PVC OUTSIDE OF BUILDING THAT IS EXPOSED TO SUNLIGHT SHALL BE WHITE PVC
4. VANAIRE SHALL PROVIDE A RAIN SKIRT ON THE STACK ALTHOUGH WATERPROOFING SHALL BE PROVIDED BY OTHERS
5. 8" DIA DUCT, DAMPER AND HOOD FOR FUTURE HARD COAT ANODIZE TANK SHALL NOT BE FABRICATED UNTIL A PURCHASE ORDER IS GIVEN FROM CUSTOMER

SCRUBBER SPECIFICATIONS

SCRUBBER CAPACITY (CFM)	17,000
SCRUBBER TYPE	HORIZONTAL
SCRUBBER PRESSURE DROP	2"
EXTERNAL STATIC PRESSURE	2"
MATERIAL OF CONTSTRUCTION	DARK GRAY PVC
PACKING DEPTH	3'-0"
PACKING MATERIAL	3.5" LANPAC
MIST ELIMINATOR	2" JEAGER
pH	NOT QUOTED
ORP	NOT QUOTED
CONDUCTIVITY	NOT QUOTED
RECIRCULATION TYPE	REMOTE
RECIRCULATION RATE	152 GPM
BLOWDOWN RATE	1% - 5% OF RECIRC. RATE
PUMP VOLTAGE	230/460v - 3ϕ - 60hz

EXHAUST FAN SPECIFICATIONS

VC FAN NUMBER	730	STATIC PRESSURE	4"
CFM	17,000	RPM	972
MATERIAL OF CONTSTRUCTION	DARK GRAY PVC	BRAKE HORSE POWER	15
WHEEL TYPE	BACKWARD INCLINE	MOTOR HORSE POWER	20
CLASS	2	VOLTAGE	230/460v-3ϕ-60hz
ARRANGEMENT	9	INLET	FLANGED
ROTATION	CLOCKWISE	APPROXIMATE FAN WEIGHT	1150
DISCHARGE	TOP HORIZONTAL	APPROXIMATE MOTOR WEIGHT	200

PUSH AIR FAN SPECIFICATIONS

VCI FAN NUMBER	8	STATIC PRESSURE	12"
CFM	684	RPM	3228
MATERIAL OF CONTSTRUCTION	DARK GRAY PVC	BRAKE HORSE POWER	3
WHEEL TYPE	PADDLE	MOTOR HORSE POWER	5
CLASS	2	VOLTAGE	230/460v-3ϕ-60hz
ARRANGEMENT	9	INLET	FLEX
ROTATION	CLOCKWISE	APPROXIMATE FAN WEIGHT	170
DISCHARGE	BOTTOM HORIZONTAL	APPROXIMATE MOTOR WEIGHT	70

MATERIAL SPECIFICATION

PVC TYPE 1	☐
TYPE 2	☐
LT. GRAY	☐
DK. GRAY	☐
WHITE	☐
CPVC	☐
P/P NATURAL	☐
BLACK	☐
WHITE	☐
FRP. OVERWRAP	☐
SEE NOTES FOR MATERIAL SPEC	☒

NO.	DATE	BY	DESCRIPTION
1	3-18-99	MM	MOVED TRUNK LINE OVER SMALL HOODS

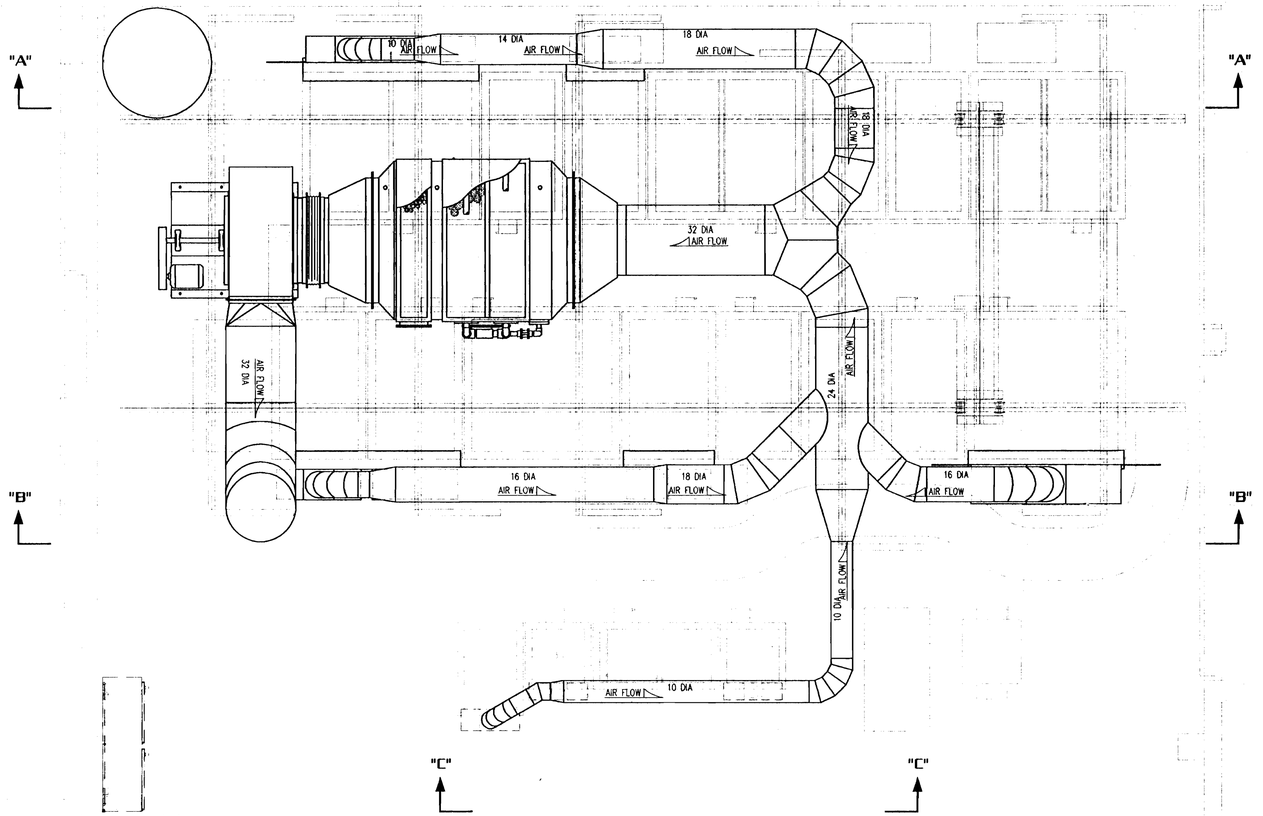
REVISIONS

VANAIRE
10151 BUNSEN WAY
LOUISVILLE, KY. 40299
(502) 491-3553 (502) 491-5182 (FAX)
DIVISION OF VANCAS ENTERPRISES, INC.

TITLE
17,000 CFM PUSH - PULL VENTILATION SYSTEM
-PLAN VIEW-

BY: M.MATTINGLY	DATE: 2-8-99	CUSTOMER: NCA SYSTEMS, INC.	
ENGINEER	DATE		
PROJ. MGR: JKR	DATE: 3-19-99	END USER: TED JURASSIC TOOL AND DIE	
ESTIMATOR	DATE	P.O.	
W.O. # 6422	DRAWING NO. 99-6422-3	REV. 1	
SCALE: 1/8 = 1'-0"			

BEST AVAILABLE COPY



MATERIAL SPECIFICATION	
PVC TYPE 1	☐
TYPE 2	☐
LT. GRAY	☐
DK. GRAY	☐
WHITE	☐
CPVC	☐
P/P NATURAL	☐
BLACK	☐
WHITE	☐
FRP OVERWRAP	☐
SEE NOTES FOR MATERIAL SPEC	☒

NO.	DATE	BY	DESCRIPTION
1	3-18-99	MM	

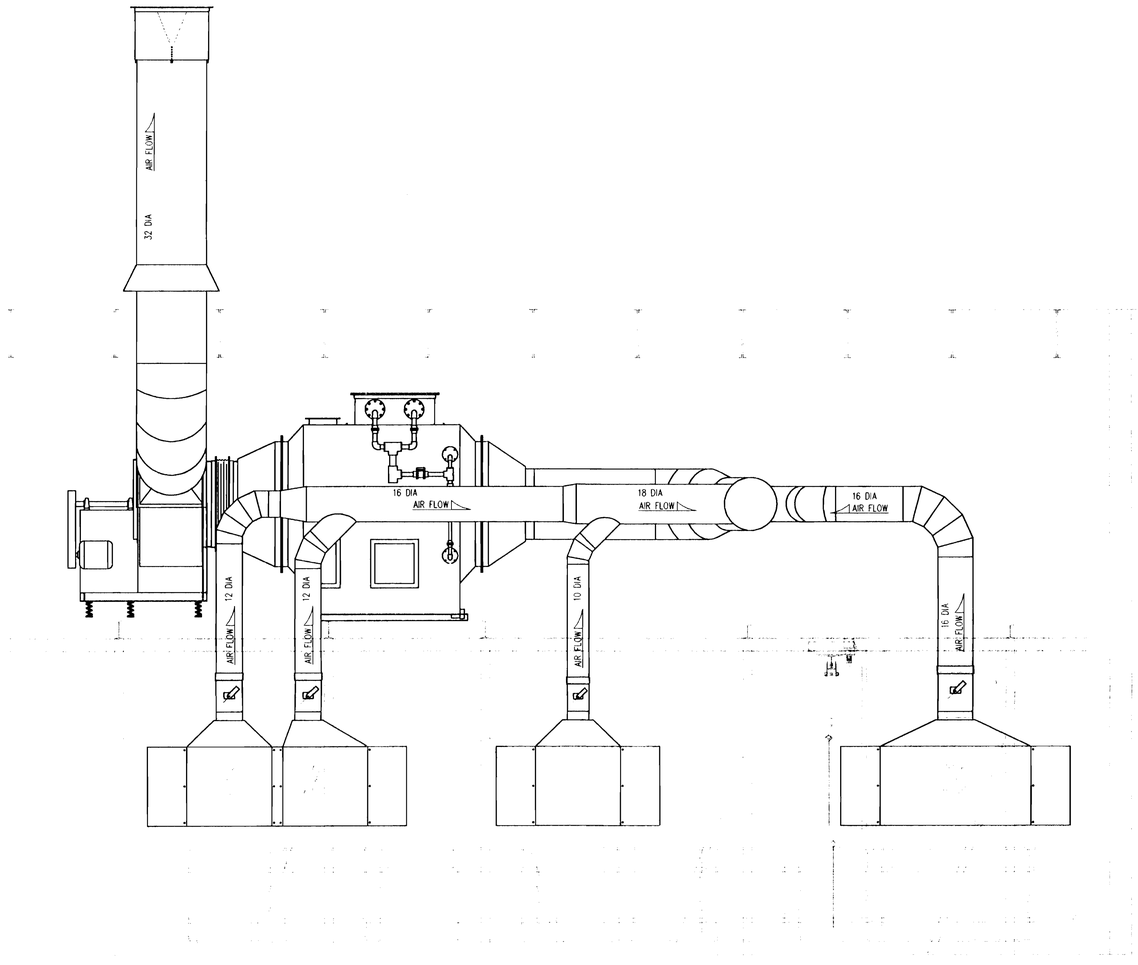
REVISIONS

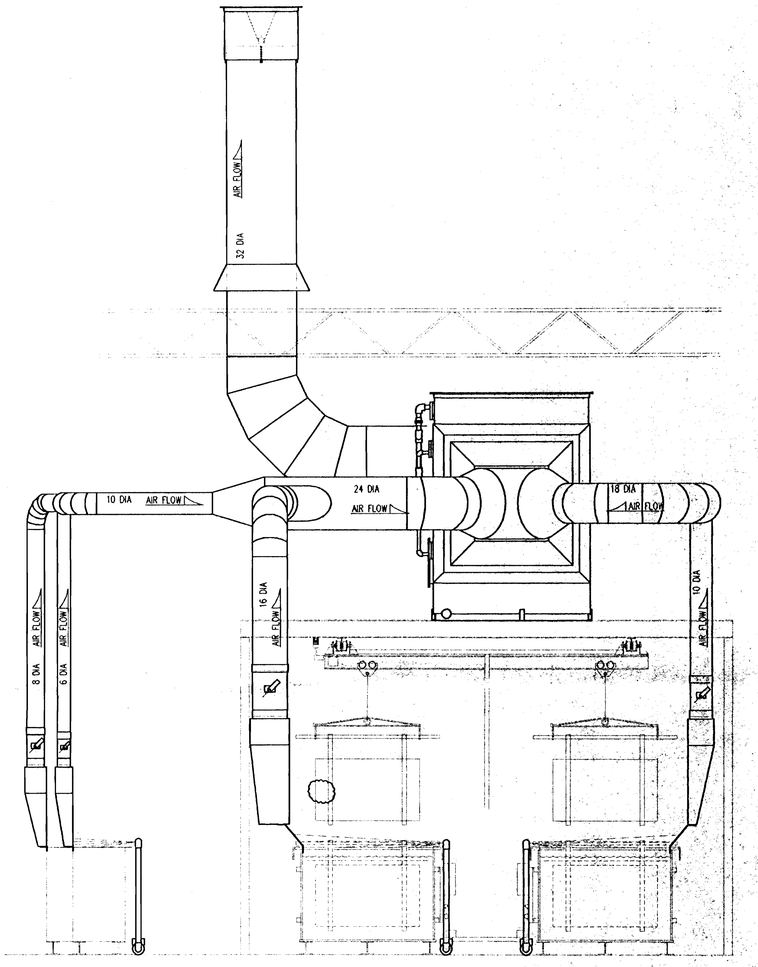
VANAIRE
10151 BUNSEN WAY
LOUISVILLE, KY. 40299
(502) 491-3553 (502) 491-5182 (FAX)
DIVISION OF VANAIRE ENTERPRISES, INC.

TITLE
17,000 CFM PUSH - PULL
VENTILATION SYSTEM

-PLAN VIEW-

BY M.MATTINGLY	DATE 2-8-99	CUSTOMER NCA SYSTEMS, INC.	
ENGINEER	DATE		
PROJ. MGR.	DATE	END USER TED JURAKSIC TOOL AND DIE	
ESTIMATOR	DATE	P.O.	
W.O. 6422	DRAWING NO. 99-6422-3		REV. 1
SCALE 3/8" = 1'-0			





MATERIAL SPECIFICATION	
PVC TYPE 1	☐
TYPE 2	☐
LT. GRAY	☐
DK. GRAY	☐
WHITE	☐
CPVC	☐
P/P NATURAL	☐
BLACK	☐
WHITE	☐
FRP OVERWRAP	☐
SEE NOTES FOR MATERIAL SPEC	☒

NO.	DATE	BY	DESCRIPTION
1	3-19-99	MM	

REVISIONS

VANAIRE
10151 BUNSEN WAY
LOUISVILLE KY 40299
(502) 491-1555 (502) 491-5182 (FAX)
DIVISION OF VANAIRE ENTERPRISES, INC.

TITLE
17,000 CFM PUSH - PULL
VENTILATION SYSTEM
-SECTION A-A-
-SIDE ELEVATION VIEW-

BY M.MATTINGLY	DATE 2-8-99	CUSTOMER MCA SYSTEMS, INC.
ENGINEER	DATE	
PROJ. MGR.	DATE	END USER TED JURASSIC TOOL AND DIE
ESTIMATOR	DATE	P.O.
W.O. 6422	DRAWING NO. 99-6422-A	REV. 1
SCALE 3/8" = 1'-0"		

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OFFICIAL USE

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Jul - Sep 04

Postmark Here

AIRS ID # 0990579001AG 7
TED JURACSIK TOOL & DIE (TJTD)
255 North Congress Avenue
DELRAY BEACH, 33445

PS Form 3800, January 2001 See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1 Article Addressed to:

AIRS ID # 0990579001AG 7
TED JURACSIK TOOL & DIE (TJTD)
255 North Congress Avenue
DELRAY BEACH, 33445

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Gail Schuler ☐ Agent ☐ Addressee

B. Received by (Printed Name) GAIL SCHULER
C. Date of Delivery 9/14/04

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2 Article Number
(Transfer from service label) 7001 1140 0001 7556 3661

PS Form 3811, August 2001 Domestic Return Receipt 102595-02-M-1540

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