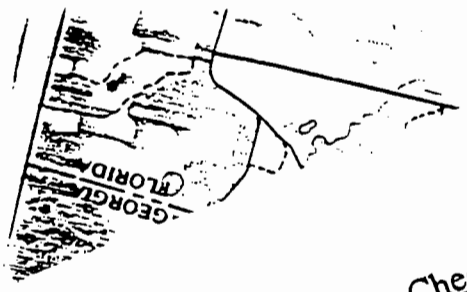


Check Sheet

Company Name: Reichhold Chemicals, Inc.
Permit Number: AC 127-127981
PSD Number:
Permit Engineer:

Cross References:
- ☐
- ☐
- ☐

Application:
- ☑ Initial Application
- ☐ Incompleteness Letters
- ☐ Responses
- ☐ Waiver of Department Action
- ☐ Department Response
- ☐ Other

Intent:
- ☑ Intent to Issue
- ☑ Notice of Intent to Issue
- ☑ Technical Evaluation
- ☒ BACT or LAER Determination
- ☐ Unsigned Permit
- Correspondence with:
  - ☐ EPA
  - ☐ Park Services
  - ☐ Other
- ☑ Proof of Publication
- ☐ Petitions - (Related to extensions, hearings, etc.)
- ☐ Waiver of Department Action
- ☐ Other

Final Determination:
- ☑ Final Determination
- ☑ Signed Permit
- ☒ BACT or LAER Determination
- ☐ Other

Post Permit Correspondence:
- ☐ Extensions/Amendments/Modifications
- ☐ Other

Revision #5

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
R. P. Aston
Reichhold Chemicals, Inc.
P.O. Box 1433
Pensacola, FL 32596

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number
P 408 531 164

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X

7. Date of Delivery
4-2-87

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

P 408 531 164

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to R. P. Aston Reichhold Chemicals, Inc. P.O. Box 1433	
P.O., State and ZIP Code Pensacola, FL 32596	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date 4/1/87 AC 17-127981	

PS Form 3800, Feb. 1982

File Copy

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

R. P. Aston
Plant Manager
Reichhold Chemicals, Inc.
Post Office Box 1433
Pensacola, Florida 32596

April 1, 1987

Enclosed is Permit Number AC 17-127981 to Reichhold Chemicals Inc. which authorizes the construction of a crude limonene distillation facility at your existing facility in Escambia County, Florida. This permit is issued pursuant to Section 403, Florida Statutes.

Any Party to this permit has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this permit is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

Copy furnished to:

J. P. Krumbein, P.E.
J. Preece

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on April 1, 1987 to the listed persons.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to §120.52(9), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

R Bruce Whitehead
Clerk

4/1/87
Date

Final Determination

Reichhold Chemicals, Inc.
Newport Division
Pensacola, Escambia County, Florida

Crude Limonene Distillation Facility

Permit Number:
AC 17-127981

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting

March 27, 1987

Final Determination

Reichhold Chemical's application for a permit to construct a Crude Limonene Distillation facility at the Reichhold Chemicals complex in Pensacola, Escambia County, Florida, has been reviewed by the Bureau of Air Quality Management.

Public Notice of the Department's Intent to Issue the construction permit was published in the Pensacola News Journal on February 25, 1987.

Copies of the preliminary determination have been available for public inspection at the Department's District office in Pensacola and the Bureau of Air Quality Management office in Tallahassee.

No comments were received as a result of the public notice period.

The final action of the Department will be to issue the permit as noticed during the public notice period.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

PERMITTEE:
Reichhold Chemicals, Inc.
407 South Pace Boulevard
P.O. Box 1433
Pensacola, Florida 32596

Permit Number: AC 17-127981
Expiration Date: June 30, 1988
County: Escambia
Latitude/Longitude: 30° 24' 30" N
87° 14' 45" W
Project: Crude Limonene Distillation Facility

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

For the construction of a Crude Limonene Distillation Facility located at the Reichhold Chemical Complex, building No. 133 in Pensacola, Escambia County, Florida.

Construction shall be in accordance with the attached permit application except as otherwise noted in the Specific Conditions.

Attachment:

1. Application to construct Air Pollution Sources, DER Form 17-1.122(16).

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.

GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

a. Having access to and copying any records that must be kept under the conditions of the permit;

b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)
( ) Determination of Prevention of Significant Deterioration (PSD).
( ) Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

GENERAL CONDITIONS:

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

Crude Limonene Distillation Facility

1. This facility shall be allowed to operate continuously (8,760 hours per year).

2. Total VOC emissions from the facility shall not exceed 13.7 lbs per hour and 17.2 tons per year.

SPECIFIC CONDITIONS:

3. Compliance with the VOC emission standard will be determined by Method 25, 25A, 25B, or other methods approved by the department. The concentration data and calculated mass emission rate will be reported. Thereafter, compliance with the VOC emission limitations will be maintained based on the VOC inventory. The district office shall be notified 15 days prior to the test.

4. The construction shall reasonably conform to the plans and schedule submitted in the application. If the permittee is unable to complete construction on schedule, he must notify the Department in writing 60 days prior to the expiration of the construction permit, submit a new schedule, and request an extension of the construction permit expiration date.

5. To obtain a permit to operate, the permittee must demonstrate compliance with the conditions of the construction permit and submit a complete application for an operating permit, including the application fee, along with test results and Certificate of Completion, to the Department's Northwest District office 90 days prior to the expiration date of the construction permit. The permittee may continue to operate in compliance with all terms of the construction permit until its expiration date. Operation beyond the construction permit expiration date requires a valid permit to operate.

6. Upon obtaining an operating permit, the applicant will be required to submit annual reports on the actual operation and emissions of the facility. Annual material balance reports (24-hour) shall be required and sent to the Department's Northwest District office to assess emissions and maintain the VOC inventory.

7. If the construction permit expires prior to the permittee requesting an extension or obtaining a permit to operate, then all activities at the project must cease and the permittee must apply for a new permit to construct which can take up to 90 days to process a complete application.

8. Reasonable precautions to prevent fugitive particulate emissions during construction, such as coating or spraying roads and construction sites, will be taken by the applicant.

PERMITTEE:
Reichhold Chemicals, Inc.

Permit Number: AC 17-127981
Expiration Date: June 30, 1988

SPECIFIC CONDITIONS:

9. According to FAC Rule 17-2.620(1)(a), no person shall store, pump, handle, process, load, unload, or use in any process or installation volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems deemed necessary and ordered by the department. The following procedures shall be utilized to minimize pollutant emissions, but shall not be limited to:

- o maintain tightly fitting covers, lids, etc., on all containers of VOC when they are not being handled, tapped, etc.;
- o where possible and practical, procure/fabricate a tightly fitting cover for any open trough, basin, bath, etc., of VOCs that it can be covered when not in use;
- o all fittings, valve lines, etc., shall be properly maintained;
- o prevent excessive turbulence across exposed VOC;
- o all VOC spills shall be attended to immediately and the waste properly disposed of, recycled, etc.

11. No objectionable odors are allowed from this facility.

Issued this 31 day of March, 1987.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Dale Twachtmann

Dale Twachtmann, Secretary

____ pages attached

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

Office of the Secretary

FOR ROUTING TO OTHER THAN THE ADDRESSEE

To: _____ Locth: _____
To: _____ Locth: _____
To: _____ Locth: _____
From: _____ Date: _____

TO: Dale Twachtmann

THRU: Howard Rhodes

FROM: Clair Fancy

8-1344 When Signed

DATE: March 27, 1987

SUBJ: Approval of Air Construction Permit

Attached for your approval and signature is an air construction permit for Reichhold Chemicals, Inc. to authorize the construction of a crude limonene distillation facility at the applicant's existing facility in Pensacola, Escambia County, Florida. There have been no controversies regarding this permit.

Day 90, after which the permit would be issued by default, is April 5, 1987.

The bureau recommends your approval and signature.

CF/ks

Attachment

Reichhold Chemicals, Inc.
Newport Division
407 South Pace Boulevard
P.O. Box 1433
Pensacola, Florida 32596

REICHHOLD

March 9, 1987

DER
MAR 20 1987
BAQM

Ed M

Mr. E. Middleswart
Florida DER, NW District
160 Governmental Center
Pensacola, FL 32501

Dear Mr. Middleswart:

The performance test on the Reichhold new boiler no. 11 (permit AC17-119127) has been completed and an operating permit request will be submitted shortly. As we discussed, boilers 8 and 9 are permanently shut down and these permits can be returned anytime. However, due to the delay in construction of the new Crude Limonene Distillation facility (permit AC17-127981 currently scheduled for completion in September 1987), boiler no. 11 cannot supply the total plant steam requirements at maximum operation. We, therefore, request to retain the permit for boiler no. 10 through this period.

Boiler 10 or boiler 11 would be in operation during this period. The boilers would not be run at the same time.

Thank you for your attention and assistance.

Sincerely,

R. W. Clarke

R. W. Clarke
Senior Environmental Engineer

RWC:mab

cc:
Teresa Heron 3-20-87 AAR
To: Bill Thomas 3-20-87

RECEIVED
MAR 10 1987
NORTHWEST FLORIDA
DER

Tel.: (904) 433-7621
(800) 874-0868
Telex: 702424

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION) Bill Thomas	Initial	
	Date	
2. CAFS	Initial	
	Date	
3. BAQM	Initial	
	Date	
4. DER - Tallahassee	Initial	
	Date	

REMARKS:

Please respond to this request.

The permits for Boilers 8 & 9 have been surrendered. Boiler 8 was the highest emitter.

We recommend approval.

INFORMATION

- Review & Return
- Review & File
- Initial & Forward

DER

MAR 20 1987

BAQM

DISPOSITION

- Review & Respond
- Prepare Response
- For My Signature
- For Your Signature
- Let's Discuss
- Set Up Meeting
- Investigate & Report
- Initial & Forward
- Distribute
- Concurrence
- For Processing
- Initial & Return

FROM: Jon S Rees

DATE Mar 19 1987

PHONE SC 695-8314

PM
3-9-87
Pensacola, FL

Reichhold Chemicals, Inc.
Newport Division
407 South Pace Boulevard
P.O. Box 1433
Pensacola, Florida 32596

DER

MAR 10 1987

BAQM

REICHHOLD

March 6, 1987

Mr. Clair H. Fancy, P.E. Deputy Chief
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, FL 32301-8241

Dear Mr. Fancy:

Construction Permit AC17-127981

Attached is the original notarized verification containing the public notice of the proposed "crude limonene distillation facility" construction permit published February 25, 1987, in the Pensacola News Journal.

Sincerely,

R. W. Clarke

R. W. Clarke
Senior Environmental Engineer

RWC:mab

Attachment

cc: R. J. Bryan - RCI, Pensacola
E. G. Fleming - RCI, Pensacola
A. H. Keyser - RCI, Pensacola
T. W. Moody - DER, Pensacola
J. Preece - DER, Pensacola
T. Heron - BAQM 3-10-87 PM RWC

Tel.: (904) 433-7621
(800) 874-0868
Telex: 702424

PENSACOLA
News Journal

PUBLISHED DAILY
PENSACOLA, ESCAMBIA COUNTY, FLORIDA

State of Florida,
County of Escambia.

Before the undersigned authority personally appeared
J. Diane Deal

who on oath says that she is Legal Advertising Supervisor
of the Pensacola News Journal, a daily newspaper published at Pensacola in Escambia County, Florida; with general circulation in Escambia, Santa Rosa, Okaloosa and Walton Counties that the attached copy of advertisement, being a NOTICE in the matter of

Notice of Intent

in the _____ Court,

was published in said newspaper in the issues of

Feb. 25, 1987

Affiant further say that the said The Pensacola News Journal is a newspaper published at Pensacola, in said Escambia County, Florida, and that the said newspaper has heretofore been continuously published in said Escambia County, Florida, each day and has been entered as second class mail matter at the post office in Pensacola, in said Escambia County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

J. Diane Deal

Sworn to and subscribed before me this 2nd day of March, A.D., 19 87

Billy J. Fenton
NOTARY PUBLIC.

My Commission Expires Oct. 16, 1987

State of Florida
Department of
Environmetnal
Regulation
Notice of Intent

The Department gives notice of its intent to issue a permit to Reichold Chemicals, Inc. to construct a crude limonene distillation facility located at the Riechhold Chemical Complex, building No. 133 in Pensacola, Escambia County, Florida. A determination of best available control technology (BACT) was not required.

Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative determination (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Failure to file a petition within this time period constitutes a waiver of any right such person has to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the proposed agency action. Therefore, persons who may not wish to file a petition may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Rule 28-5.207, Florida Administrative Code, at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009. Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

The application is available for public inspection during normal business hours 8:00 A.M. to 5:00 P.M., Monday through Friday, except legal holidays, at:

Dept. of
Environmental Regulation
Bureau of Air
Quality Management
2600 Blair Stone Road
Tallahassee, Florida
32399-2400

Dept. of
Environmental Regulation
Northwest District
160 Governmental Center
Pensacola, Florida 32501

Any person may send written comments on the proposed action to Mr. Bill Thomas at the department's Tallahassee address. All comments mailed within 14 days of the publication of this notice will be considered in the department's final determination.

LEGAL NO. 32532 1T
FEB. 25, 1987

P 408 531 163

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Mr. R. P. Aston	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date 2/17/87	

PS Form 3800, Feb. 1982

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

February 17, 1987

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. R. P. Aston
Plant Manager
Reichhold Chemicals, Inc.
Post Office Box 1433
Pensacola, Florida 32596

Dear Mr. Aston:

Attached is one copy of the Technical Evaluation and Preliminary Determination, and proposed permit to construct a crude limonene distillation facility at your facility in Pensacola, Escambia County, Florida.

Please submit, in writing, any comments which you wish to have considered concerning the department's proposed action to Mr. Bill Thomas of the Bureau of Air Quality Management.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/pa

Attachments

cc: J. P. Krumbein, P.E.
Jack Preece

State of Florida
Department of Environmental Regulation
Notice of Intent

The Department gives notice of its intent to issue a permit to Reichhold Chemicals, Inc. to construct a crude limonene distillation facility located at the Riechhold Chemical Complex, building No. 133 in Pensacola, Escambia County, Florida. A determination of best available control technology (BACT) was not required.

Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative determination (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Failure to file a petition within this time period constitutes a waiver of any right such person has to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the proposed agency action. Therefore, persons who may not wish to file a petition may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Rule 28-5.207, Florida Administrative Code, at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009, Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Dept. of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dept. of Environmental Regulation
Northwest District
160 Governmental Center
Pensacola, Florida 32501

Any person may send written comments on the proposed action to Mr. Bill Thomas at the department's Tallahassee address. All comments mailed within 14 days of the publication of this notice will be considered in the department's final determination.

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permit by:

Reichhold Chemicals, Inc.
Post Office Box 1433
Pensacola, Florida 32596

DER File No. AC 17-127981

INTENT TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit (copy attached) for the proposed project as detailed in the application specified above. The Department is issuing this Intent to Issue for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, Reichhold Chemicals, Inc., applied on December 2, 1986, to the Department of Environmental Regulation for a permit to construct a crude limonene distillation facility at the applicant's existing facility in Pensacola, Escambia County, Florida.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes and Florida Administrative Code Rules 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that an air construction permit was needed for the proposed work.

Pursuant to Section 403.815, F.S. and DER Rule 17-103.150, FAC, you (the applicant) are required to publish at your own expense the enclosed Notice of Proposed Agency Action on permit application. The notice must be published one time only in a section of a major local newspaper of general circulation in the county in which the project is located and within thirty (30) days from receipt of this intent. Proof of publication must be provided to the Department within seven days of publication of

the notice. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S. A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. Petitions must comply with the requirement of Florida Administrative Code Rules 17-103.155 and 28-5.201 (copies enclosed) and be filed with (received by) the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant must be filed within fourteen (14) days of receipt of this intent. Petitions filed by other persons must be filed within fourteen (14) days of publication of the public notice or within fourteen (14) days of receipt of this intent, whichever first occurs. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes, concerning the subject permit application. Petitions which are not filed in accordance with the above provisions will be dismissed.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

Copies furnished to:

R. P. Aston
J. P. Krumbein, P.E.
Jack Preece

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on Feb. 17, 1987.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to §120.52(9), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Patricia G. Adams — Clerk

Feb. 17, 1987 — Date

RULES OF THE ADMINISTRATIVE COMMISSION
MODEL RULES OF PROCEDURE
CHAPTER 28-5
DECISIONS DETERMINING SUBSTANTIAL INTERESTS

28-5.15 Requests for Formal and Informal Proceedings

(1) Requests for proceedings shall be made by petition to the agency involved. Each petition shall be printed, typewritten or otherwise duplicated in legible form on white paper of standard legal size. Unless printed, the impression shall be on one side of the paper only and lines shall be double spaced and indented.

(2) All petitions filed under these rules should contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name and address of the petitioner or petitioners;

(c) All disputed issues of material fact. If there are none, the petition must so indicate;

(d) A concise statement of the ultimate facts alleged, and the rules, regulations and constitutional provisions which entitle the petitioner to relief;

(e) A statement summarizing any informal action taken to resolve the issues, and the results of that action;

(f) A demand for the relief to which the petitioner deems himself entitled; and

(g) Such other information which the petitioner contends is material.

Technical Evaluation and Preliminary Determination

Reichhold Chemicals, Inc.
Newport Division
Pensacola, Escambia County, Florida

Crude Limonene Distillation Facility
Permit No. AC 17-127981

Florida Department of Environmental Regulation
Bur[illegible]n of Air Quality Management
Central Air Permitting

February 10, 1987

I. SYNOPSIS OF APPLICATION

I.1 NAME AND ADDRESS OF APPLICANT

Reichhold Chemicals Inc.
Newport Division
P. O. Box 1433
Pensacola, Florida 32596

I.2 REVIEWING AND PROCESS SCHEDULE

Date or Receipt of Application:
December 2, 1986

Completeness Review (30 days):
January 1, 1987

Applications Completeness Date:
December 2, 1986

II. FACILITY INFORMATION

I.1 FACILITY LOCATION

The proposed facility will be located at the Reichhold Chemical complex, building No. 133, 407 South Pace Boulevard in Pensacola, Escambia County, Florida. The latitude and longitude of this site are 30° 24' 30" North and 87° 14' 45" West, respectively.

II.2 STANDARD INDUSTRIAL CLASSIFICATION CODE (SIC)

Reichhold Chemicals Inc. is classified as follows:

Major Group - Chemicals and Allied Products

Group No. 282 - Plastics Materials and Synthetic Resins, Synthetic Rubber, Synthetic and Other Man-Made Fibers, Except Glass

Industry No. 2821 - Plastics

II.3 FACILITY CATEGORY

Reichhold Chemicals, Inc. is classified as a major emitting facility for particulate matter (PM) and volatile organic compounds (VOC). The proposed project, constructing a new crude limonene distillation facility, will increase overall VOC emissions by 17.2 tons per year.

This facility category, chemical process plant, is on the list of the 28 Major Facility Categories, Table 500-1, Chapter 17-2, Florida Administrative Code.

III. PROJECT DESCRIPTION AND POLLUTION CONTROL SYSTEM

The process basically consists of two fractionating columns operating in series at approximately 25 mm Hg absolute pressure.

Crude limonene is pumped continuously into the first or light ends tower where low-boiling compounds including alpha pinene and myrcene are concentrated and removed as the overhead from the column. The tower bottoms are continuously pumped to the second or product column where the product limonene is removed as the overhead and a small amount of residual bottoms removed and stored for future use or as fuel.

The light ends fractionating column is used to purify the solvent xylene used in the manufacture of polyterpene resins, the end product for which limonene is used as the raw material. The xylene is removed as an overhead while the contaminants consisting of paracymene and limonene are removed as bottoms.

III.1 Controls

The organic vapors are condensed and subcooled by the ejector after condenser. The non-condensable vapors consisting mainly of air with traces of hydrocarbons vapors are vented to the atmosphere. The efficiency of the control device, the heliflow condenser, is based on condensing the vacuum ejector vapor discharge. A 94% plus removal efficiency is expected from this control device.

IV. RULE APPLICABILITY

The proposed project is subject to preconstruction review under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2, Florida Administrative Code.

The proposed facility, a crude limonene distillation facility, is located at Reichhold Chemical complex in an area (Escambia County) currently designated attainment for all criteria pollutants in accordance with Florida Administrative Code, Rule 17-2.420.

Reichhold Chemicals, Inc., is a major emitting facility for particulate matter (385 tons per year) and volatile organic compounds (311 tons per year), as defined in Rule 17-2.100, FAC.

This facility category, Chemical Process Plant, is in the list of the 28, Table 500-1. Major Facility Category, Rule 17-2.500, FAC.

The proposed project is exempt from provisions of Rule 17-2.500, Prevention of Significant Deterioration because its emissions do not exceed the PSD significance levels.

The proposed project shall be permitted under Rule 17-2.520, Sources Not Subject to Prevention of Significant Deterioration or Nonattainment Requirements.

The proposed facility shall comply with and Rule 17-2.620(1) and (2), General Pollutant Emission Limiting Standards.

V. SOURCE IMPACT ANALYSIS

V.1 EMISSIONS SUMMARY

The distillation of crude limonene will produce emissions of volatile organic compounds (VOC). Specifically, alpha pinene, myrcene, limonene, alpha terpineol and xylene.

The estimated potential and actual VOC emissions due to the storage of raw materials and products along with the process emission losses are summarized in Table 1.

All chemical compounds used during the process and their emissions are limited by permit conditions. These permitted emissions are in compliance with all applicable requirements of Chapter 17-2, Florida Administrative Code.

Table II shows the increase and decrease of emissions from the new facilities since the year 1984.

For future modification, Reichhold Chemicals Inc. may be subject to prevention of significant deterioration (PSD) regulations, if the contemporaneous emission increase of any pollutant is at or greater than the significant emission rates listed in Table 500-1 Chapter 17-2, FAC.

V.2 AIR TOXICS INFORMATION

Currently, the department is developing acceptable ambient concentrations for toxic substances. Specifically, sources classified as Category A (carcinogens and highly toxic) and Cateogry B (moderately toxic substances).

In the event toxics emission limits are set during the term of this permit or any subsequent permit which are different than

the permitted emissions, the department may seek modification pursuant to Rule 17-4.08, FAC.

V.3 AIR QUALITY ANALYSIS

From a technical review of the application, the Department has determined that the construction and operation of this source will not have a detrimental impact on Florida's ambient air quality standards.

VI. CONCLUSIONS

Based on a review of the data submitted by Reichhold, the Florida Department of Environmental Regulation (FDER) concludes that compliance with all applicable state air quality regulations will be achieved, provided certain specific conditions are met. The impact of constructing and operating a crude limonene distillation facility at the Pensacola plant will not cause or contribute to a violation of any ambient air quality standard.

Table 1

Summary of Emissions

Crude Limonene Facility

Source	Pollutant - VOC	
Distillation Process	Vents 133-11, 133-12	
	lbs/hr	tons/yr
Alpha Pinene	1.03	4.33
Myrcene	1.00	4.21
Limonene	1.63	6.86
Xylene	10.06	1.69
	13.72	17.09

Tankage Breathing and Working Losses
Vent 133-13, 133-14, 133-15

	lbs/hr	tons/yr
Limonene	0.02	0.08
Alpha Pinene	0.01	0.01
Myrcene	0.01	0.01
Alpha Terpineol	0.01	0.01
	0.05	0.11

Table 2

Summary of Emissions
Reichhold Chemicals Inc.

Facility	Year	Pollutant VOC	PM	NOx
Terpene-phenol resin AC 17-098127	1985	+15.38 -52.42		
Resin Flaking and Bag Packaging AC 17-104265	1985		+2.1	
Boiler No. 11 AC 17-119127	1986			-9.41
Crude Limonene AC 17-127981	1987	+17.2		
Pilot Plant AC 17-115381 AC 17-115382 (permits under review)	1987	+1.1		
Total Emission Increase			+33.68	VOC
Emission Decrease			-52.42	VOC

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

PERMITTEE:
Reichhold Chemicals, Inc.
407 South Pace Boulevard
P.O. Box 1433
Pensacola, Florida 32596

Permit Number: AC 17-127981
Expiration Date: June 30, 1988
County: Escambia
Latitude/Longitude: 30° 24' 30" N
87° 14' 45" W
Project: Crude Limonene Distillation Facility

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

For the construction of a Crude Limonene Distillation Facility located at the Reichhold Chemical Complex, building No. 133 in Pensacola, Escambia County, Florida.

Construction shall be in accordance with the attached permit application except as otherwise noted in the Specific Conditions.

Attachment:

1. Application to construct Air Pollution Sources, DER Form 17-1.122(16).

PERMITTEE:
Reichhold Chemicals, Inc.

Permit Number: AC 17-127981
Expiration Date: June 30, 1988

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.

GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

a. Having access to and copying any records that must be kept under the conditions of the permit;

b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)
( ) Determination of Prevention of Significant Deterioration (PSD).
( ) Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

GENERAL CONDITIONS:

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

Crude Limonene Distillation Facility

1. This facility shall be allowed to operate continuously (8,760 hours per year).

2. Total VOC emissions from the facility shall not exceed 13.7 lbs per hour and 17.2 tons per year.

SPECIFIC CONDITIONS:

3. Compliance with the VOC emission standard will be determine by Method 25, 25A, 25B, or other methods approved by the department. Concentration data and calculated mass emission rate will be reported. Thereafter, compliance with the VOC emission limitations will be maintained based on the VOC inventory. The district office shall be notified 15 days prior to test.

4. The construction shall reasonably conform to the plans and schedule submitted in the application. If the permittee is unable to complete construction on schedule, he must notify the Department in writing 60 days prior to the expiration of the construction permit and submit a new schedule and request for an extension of the construction permit.

5. To obtain a permit to operate, the permittee must demonstrate compliance with the conditions of the construction permit and submit a complete application for an operating permit, including the application fee, along with test results and Certificate of Completion, to the Department's Northwest District office 90 days prior to the expiration date of the construction permit. The permittee may continue to operate in compliance with all terms of the construction permit until its expiration date. Operation beyond the construction permit expiration date requires a valid permit to operate.

6. Upon obtaining an operating permit, the applicant will be required to submit annual reports on the actual operation and emissions of the facility. Annual material balance reports (24-hour) shall be required and sent to the Department's Northwest District office to assess emissions and maintain VOC inventory.

7. If the construction permit expires prior to the permittee requesting an extension or obtaining a permit to operate, then all activities at the project must cease and the permittee must apply for a new permit to construct which can take up to 90 days to process a complete application.

8. Reasonable precautions to prevent fugitive particulate emissions during construction such as coating or spraying roads and construction sites will be taken by the applicant.

PERMITTEE:
Reichhold Chemicals, Inc.

Permit Number: AC 17-127981
Expiration Date: June 30, 1988

SPECIFIC CONDITIONS:

9. According to FAC Rule 17-2.620(1)(a), no person shall store, pump, handle, process, load, unload, or use in any process or installation volatile organic compounds or organic solvents without applying known and existing vapor emission control device or systems deemed necessary and ordered by the department. The following procedures shall be utilized to minimize pollutant emissions, but shall not be limited to:

- o maintain tightly fitting covers, lids, etc., on all containers of VOC when they are not being handled, tapped, etc.;
- o where possible and practical, procure/fabricate a tightly fitting cover for any open trough, basin, bath, etc., of VOCs that it can be covered when not in use;
- o all fittings, valve lines, etc., shall be properly maintained;
- o prevent excessive turbulence across exposed VOC;
- o all VOC spills shall be attended to immediately and the waste properly disposed of, recycled, etc.

11. No objectionable odors are allowed from this facility.

Issued this_____day of_____, 19___.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

_____
Dale Twachtmann, Secretary

____ pages attached

Reichhold Chemicals, Inc.
Newport Division
407 South Pace Boulevard
P.O. Box 1433
Pensacola, Florida 32596

DER

DEC 2 1986

BAQM

REICHHOLD

November 24, 1986

Mr. Clair Fancy
Bureau of Air Quality Management
2600 Blairstone Road
Tallahassee, FL 32301

Dear Mr. Fancy:

Enclosed is a construction permit application for a new Crude Limonene Distillation facility we will be building at our Pensacola plant. Emissions consist entirely of VOC.

The new installation does not require new source review or PSD review as the net emission increase is less than 25 tons per year.

Enclosed is a check for $100 covering the permit application fee.

Attached behind the application is supplementary information relative to the APIS program. This information, although not specifically required, has been requested in the past by your permit evaluators.

If you have any questions or need additional information please contact me at (904) 433-7621.

Sincerely,

Robert W. Clarke

Robert W. Clarke
Senior Environmental Engineer

RWC:mab

Enclosures
Certified - ret.rec.
cc: R. P. Aston - Reichhold, Pensacola
E. G. Fleming - Reichhold, Pensacola
A. H. Keyser - Reichhold, Pensacola
R. V. Kriegel - DER, Pensacola
T. W. Moody - DER, Pensacola
C. Q. Schneider - Reichhold, Pensacola

RECEIVED
DER - MAIL ROOM
1986 DEC -3 PM 1:27

Tel.: (904) 433-7621
(800) 874-0868
Telex: 702424

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

No. 76138

RECEIPT FOR APPLICATION FEES AND MISCELLANEOUS REVENUE

Received from Buckhold Chemicals Date Dec. 3, 1987

Address P.O. Box 1433, Pensacola FL 32596 Dollars $ 100.00

Applicant Name & Address Same as above

Source of Revenue

Revenue Code 301031 Application Number AC 17-127981

By Patricia G. Adams

Reichhold Chemicals, Inc.
Chemical Coatings Division
407 South Pace Boulevard
P.O. Box 1433
Pensacola, Florida 32596

REICHHOLD

November 19, 1986

To Whom It May Concern:

R. P. Aston is the authorized representative for the Reichhold Chemicals, Inc., Pensacola Florida Plant.

C. Q. Schneider

Clifford Q. Schneider
Vice President & General Manager
General Coatings Products
Chemical Coatings Division

Tel.: (904) 433-7621
(800) 874-0868
Telex: 702424

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHWEST DISTRICT
160 GOVERNMENTAL CENTER
PENSACOLA, FLORIDA 32501

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Limonene Distillation [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [X] Construction [ ] Operation [ ] Modification

COMPANY NAME: Reichhold Chemicals, Inc. COUNTY: Escambia

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Building No. 133 Limonene Distillaton Vent 133-11, 133-12, 133-13, 133-14 & 133-15

SOURCE LOCATION: Street 407 South Pace Boulevard City Pensacola

UTM: East _____ North _____

Latitude 30 ° 24 ' 30 "N Longitude 87 ° 14 ' 45 "W

APPLICANT NAME AND TITLE: R. P. Aston - Plant Manager

APPLICANT ADDRESS: P. O. Box 1433, Pensacola, FL 32596

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Reichhold Chemicals, Inc.

I certify that the statements made in this application for a Construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: _____

R. P. Aston - Plant Manager
Name and Title (Please Type)

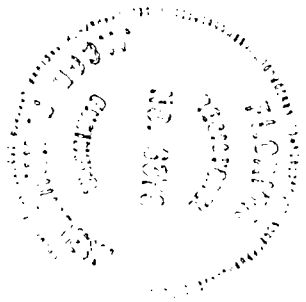
Date: 12-1-86 Telephone No. (904) 433-7621

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.



Signed Jacob P. Krumbein

J. P. Krumbein
Name (Please Type)

J. P. Krumbein Associates, Inc.
Company Name (Please Type)

8700 Meadowbrook Dr., Pensacola, FL 32514
Mailing Address (Please Type)

Florida Registration No. 6379 Date: 23 Jan. 59 Telephone No. (904) 433-7621

(904) 477-0388

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

The project comprises installation of equipment to produce refined limonene by continuous distillation of crude limonene, a by-product of the citrus industry.

Pollution abatement equipment included in the project will result in full compliance. See attached Appendix I Project Description for additional information.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction January 1987 Completion of Construction January 1988

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

Ejector After-Condenser $4,000

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

Not Applicable

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ; if power plant, hrs/yr ____; if seasonal, describe: Limonene distillation is continuous. Solvent reprocessing is intermittent and occurs approximately 336 hrs. per year.

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

   a. If yes, has "offset" been applied? ____

   b. If yes, has "Lowest Achievable Emission Rate" been applied? ____

   c. If yes, list non-attainment pollutants. ____

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? ____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
**Crude Limonene			2,500	Feed
* Xylene	Para Cymene	15	2,500	Feed

* Operation 336 hrs/yr ** Operation 8,400 hrs/yr

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): 2,500

2. Product Weight (lbs/hr): 2,365

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

VENT 133-11 LIGHT ENDS COLUMN

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Alpha Pinene	1.032	4.33	N/A	N/A	126,800	63.25	SKA-2058
Myrcene	0.722	3.03	N/A	N/A	130,100	65.05	"
Limonene	0.366	1.54	N/A	N/A	99,400	49.70	"
*Xylene	10.06	1.69	N/A	N/A	18,420	9.20	"
336 Hrs/Yr							

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
**Crude Limonene			2,500	Feed
* Xylene	Para Cymene	15	2,500	Feed

* Operation 336 hrs/yr ** Operation 8,400 hrs/yr

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): 2,500

2. Product Weight (lbs/hr): 2,365

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

VENT 133-11 LIGHT ENDS COLUMN

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Alpha Pinene	1.032	4.33	N/A	N/A	126,800	63.25	SKA-2058
Myrcene	0.722	3.03	N/A	N/A	130,100	65.05	"
Limonene	0.366	1.54	N/A	N/A	99,400	49.70	"
*Xylene	10.06	1.69	N/A	N/A	18,420	9.20	"
336 Hrs/Yr							

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): _____

2. Product Weight (lbs/hr): _____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

VENT 133-12 PRODUCT COLUMN

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Myrcene	0.281	1.18	N/A	N/A	3,234	1.62	SKA-2058
Limonene	1.266	5.32	N/A	N/A	203,700	101.8	"

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): _____

2. Product Weight (lbs/hr): _____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

VENT 133-13

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Limonene	0.0188	0.082	Not Applicable		164	0.082	SKA-2058

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): _____

2. Product Weight (lbs/hr): _____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

VENT 133-14

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Alpha Pinene	0.0047	0.018	Not Applicable		36	0.018	SKA-2058
Myrcene	0.0027	0.012	Not Applicable		24	0.012	SKA-2058

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): _____

2. Product Weight (lbs/hr): _____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

VENT 133-15

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Alpha Terpineol	0.0005	0.002	Not Applicable		4	0.002	SKA-2058

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Ejector After	Alpha Pinene	94.12	Not Applicable	Calculated
Condenser-Graham	Myrcene			
Heliflow Model	Limonene			
10 X F18ST	Xylene			

E. Fuels Not Applicable

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution): _____

F. If applicable, indicate the percent of fuel used for space heating. N/A

Annual Average _____ Maximum _____

G. Indicate liquid or solid wastes generated and method of disposal.

The liquid discharge from the ejector after condenser discharges into the plant process sewer. Process sewer discharges to the plant wastewater pretreatment system and then to the ECUA Main Street Wastewater Treatment Plant.

Not Applicable

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: _____ ft. Stack Diameter: _____ ft.

Gas Flow Rate: _____ ACFM _____ DSCFM Gas Exit Temperature: _____ °F.

Water Vapor Content: _____ % Velocity: _____ FPS

SECTION IV: INCINERATOR INFORMATION

Not Applicable

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

Total Weight Incinerated (lbs/hr) _____ Design Capacity (lbs/hr) _____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr. _____

Manufacturer _____

Date Constructed _____ Model No. _____

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diamter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) _____

Brief description of operating characteristics of control devices:

The ejector discharge vapors consisting of steam, alpha pinene, myrcene, limonene and xylene (when recovering filter solvent) are condensed and subcooled by the ejector after condenser. The non-condensable vapors consisting mainly of air with traces of hydrocarbon vapors are vented to the atmosphere.

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

The liquid discharge from the ejector after condenser are discharged to the plant process sewer which discharges into the plant wastewater pretreatment facility and then to the ECUA Main Street Wastewater Treatment Plant.

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

SEE ATTACHED DOCUMENTATION AT THE BACK OF THIS APPLICATION

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [X] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [X] No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology? N/A

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any). N/A

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary). Not Applicable

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of conatruction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

NOT APPLICABLE

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

NOT APPLICABLE

A. Company Monitored Data

1. _____no. sites _____ TSP _____( ) SO^{2}* _____ Wind spd/dir

Period of Monitoring _____/_____/_____ to _____/_____/_____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from _____/_____/_____ to _____/_____/_____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	_____	grams/sec
SO^2	_____	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

APPENDIX INDEX

APPENDIX I

PROJECT DESCRIPTION

The project comprises installation of equipment to produce refined limonene by continuous distillation of crude limonene, a by-product of the citrus industry. Pollution abatement equipment included in the project will result in full compliance.

Crude limonene is a terpene chemical recovered from the oil present in the skin of oranges, during the juice extraction process. The crude limonene is fractionally distilled to produce a refined or purified limonene, which is a basic raw material in the manufacture of polyterpene resins. Installation of the distillation equipment is the subject of this permit application.

This equipment will also be used on an intermittent basis (336 hrs/yr.) to purify the solvent used in the manufacture of polyterpene resins. The solvent primarily consists of xylene containing small quantities of para cymene, limonene, myrcene, and alpha pinene, all being terpene chemicals.

The pollution control equipment basically consists of vapor condensers and coolers which cool the vapors to $120^{o}F$ prior to atmospheric discharge thereby removing and recovering the organic compounds.

APPENDIX II

OPERATING PARAMETERS

1. Vapor Pressure in MM Hg at

	85°F	105°F	120°F
Alpha Pinene	7.02	12.05	20.25
Myrcene	4.63	8.12	13.94
Limonene	2.88	5.17	9.11
Alpha Terpineol	0.16	0.35	
Xylene	10.00	20.00	29.52
Water			88

2. Molecular Weight

Alpha Pinene, Myrcene, Limonene	136
Alpha Terpineol	154
Xylene	106

3. Miscellaneous Constants for Tank Venting
Ambient Diurnal Temperature Change $\Delta T=20^{o}F$
Paint Factor $F_p = 1.33$
Product Factor $K_c = 1.0$

4. Miscellaneous Distillation Data

	Light Ends Column	Product Column
Ejector inlet pressure - MM Hg	25	25
Ejector after Condenser Discharge Pressure - MM Hg.	760	760
Overhead Condenser Outlet Temperature °F	105	105
Ejector after Condenser Outlet Temp. °F	120	120
Air Leakage - Pounds per Hour	20	20
Ejector Steam Requirements, Pounds/Hour	368	368

5. Column Overhead Composition

(a)	Alpha Pinene %	23	-
	Myrcene %	35	1
	Limonene %	42	99
(b)	Nirez Process Solvent Redistillation		
	Xylene %	99.5	-
	Para Cymene %	0.5	-

APPENDIX III

LIMONENE DISTILLATION - LIGHT ENDS COLUMN
VENT 133-11

Quantity and Composition of Vapors to Ejectors

Temp = 105°F Pressure = 25mm Hg

Component	Vapor Pressure mm Hg	Mol Fraction in Liquid	Partial Pressure	MOLS MOL Air
Alpha Pinene	12.05	0.23	2.7715	0.1610
Myrcene	8.12	0.35	2.8420	0.1651
Limonene	5.17	0.42	2.1714	0.1261
Air			17.2151	

	Mol	Lbs # MOL Air	Lbs 20# Air	Lbs Yr.
Alpha Pinene	136	21,896	15,101	126,800
Myrcene	136	22,454	15,486	130,100
Limonene	136	17,150	11,828	99,400
Air	29			

Quantity & Composition of Vapors to Atmosphere

Temp = 120°F Pressure = 760 mm Hg

Component	Vapor Pressure mm Hg	Mol Fraction in Liquid	Partial Pressure	MOLS MOL Air
Alpha Pinene	20.25	0.356	7.209	0.0110
Myrcene	13.94	0.365	5.088	0.0077
Limonene	9.11	0.279	2.542	0.0039
Water	87.54		87.54	0.1331
Air			657,621	

Component	Mol Wt	Lbs # MOL Air	Lbs 20# Air	= Lbs Hr. Emissions
Alpha PInene	136	1.496	1.032	
Myrcene	136	1.047	0.722	
Limonene	136	0.530	0.366	
Water	18	2.396		
Air	29			

APPENDIX IV

VENT 133-11

NIREZ SOLVENT PROCESSING
XYLENE VAPORS TO EJECTOR

Temp = 105°F Vapor Pressure = 20.00 mm Hg

Operating Pressure at 100 mm Hg Molecular Wt = 106
Air Rate = 60 lbs/hr.
336 Hrs/Year

Composition of Vapors to Ejector

Xylene = 0.20 M.F. Air = 0.80 M.F. $\frac{\text{Mols Xylene}}{\text{MOLS Air}} = 0.25$

$\text{MOLS Air} = \frac{60}{29} = 2.069\#\ \text{MOLS/HR}$

Xylene to Ejector = 2.069 x 0.25 = 0.5172# MOLS/HR = 54.82#/hr =
54.82#/Hr. x 366 Hrs/Yr = 9.20 Ton/Yr.

Xylene Vapor at Ejector Exhaust
Total Pressure = 760 mm Hg Temp = 120°F.

Vapor Pressure
Water = 87.545 mm Hg
Xylene = 29.52 mm Hg

	PP	MF
Xylene =	29.52	0.0388
Water =	87.54	0.1152
Air =	642.94	0.8460

$\text{Xylene to Air Ratio} = \frac{0.0388}{0.8460} \times \frac{106}{29} = 0.1676\ \#\ \text{Xylene/\# Air}$

Xylene Rate 0.1676 (60) = 10.06 #/Hr.

$\text{Tons/yr} = \frac{10.06\ (336)}{2000} = 1.69$

APPENDIX V

VENT 133-12

Quantity and Composition of Vapors to Ejectors

Temp = 105°F Pressure = 25 mm Hg

	Liquid Comp.MF	Vapor Press. MM Hg	Partial Pressure	MOLS MOL Air	Mol. Wt.
Myrcene	0.01	8.12	0.0812	0.0041	136
Limonene	0.99	5.17	5.1183	0.2585	136
Air			19.8005		29

	Lbs # MOL Air	Lbs 20# Air	= LBS Hr.	LBS Yr.	TONS Yr.
Myrcene	0.5576	0.385		3,234	1.62
Limonene	35.1560	24.246		203,700	101.8

QUANTITY AND COMPOSITION OF VAPORS TO ATMOSPHERE

TEMP = 120°F PRESSURE = 100 MM Hg

Component	Vapor Press. mm Hg	Mol Fract in Liquid	Partial Pressure	MOLS MOL Air	MOL Wt.
Myrcene	13.94	0.0156	0.2175	0.003	136
Limonene	9.11	0.9844	8.9679	0.0135	136
Water	87.54		87.54	0.1320	18
Air			663.2746		29

	LBS / LB MOL AIR	LBS / 20 LBS Air	= LBS / HR Emissions	Tons / YR
Myrcene	0.408	0.281		1.18
Limonene	1.836	1.266		5.32

APPENDIX VI

TANKAGE BREATHING AND WORKING LOSSES

TANKAGE

Product	Volume Gals	Dia. Ft.	Height Ft.	Vent No.
Limonene	10,000	10	17	133-13
Alpha Pinene/Myrcene	2,500	8	7	133-14
Terpineol	2,500	8	7	133-15

	Molecular Weight	Vapor Pressure @ 85°F	
		MM Hg	PSIA
Limonene	136	2.88	0.056
Alpha Pinene/Myrcene	136	0.83	0.113
Alpha Terpineol	154	0.16	0.003

Ratio Alpha Pinene/Myrcene 60/40

Breathing Losses

$$LB = 2.26 \times 10^{-2}\ Mv \left(\frac{P}{P_A - P}\right)^{0.68} \Delta T^{0.5} Fp\ Kc\ D^{1.73}\ H^{0.51} C$$

M = Molecular Weight Vapor — Fp = Paint Factor = 1.33
P = Vapor Pressure — Kc = Product Factor = 1.0
ΔT = Average Ambient Diurnal Temperature Change = 20°F
C = Adjustment Factor for Small Diameter Tanks
D = Diameter — H = Height

Limonene Vent 133-13

$$LB = 2.26 \times 10^{-2} \times 136 \left(\frac{0.056}{14.7 - 0.056}\right)^{0.68} 20^{0.5} \times 133 \times 1 \times I0^{1.73} \times 17^{0.51} \times 0.53 = 2.26 \times 10^{-2} \times 136 \times 0.0227 \times 4.4721 \times 1.33 \times 1 \times 3.7032 \times 4.2416 \times 0.53 = 50.1139 \text{ lbs/yr.}$$

Alpha Pinene/Myrcene Vent 133-14

$$LB = 2.26 \times 10^{-2} \times 136 \left(\frac{0.113}{(14.7 - 0.113)}\right)^{0.68} 20^{0.5} \times 1.33 \times 1 \times 8^{1.73} \times 7^{0.51} \times 0.43 = 7.8611 \times \left(\frac{0.113}{(14.7 - 0.113)}\right)^{.68} \times 8^{1.73} \times 7^{0.51} = 774.1554 \times (0.113/14.7 - 0.113)^{0.68} = 28.41 \text{ lbs/yr}$$

Alpha Pinene = 17 lbs/yr
Myrcene = 11.4 lbs/yr

Alpha Terpineol Vent 133-15

$$LB = 2.26 \times 10^{-2} \times 154 \left(\frac{0.003}{(14.7 - 0.003)}\right)^{0.68} \times 20^{0.5} \times 1.33 \times 8^{1.73} \times 7^{0.51} \times 0.43 \quad 876.171 \times \left(\frac{0.003}{(14.7 - 0.003)}\right)^{0.68}$$

= 2.7135 lbs/yr

Total VOC Breathing Losses 81 lbs/yr.

WORKING LOSSES

Annual Volume:	Limonene	2,500,000 gals.
	Alpha Pinene/Myrcene	107,500 gals.
	Alpha Terpineol	67,500 gals.

$Lw = 2.4 \times 10^{-5}$ MvPVNKnKc
V=Tank Capacity gals
N=Number of turnovers per year
Kc=Product Factors=1
Kn=Turnover Factor

LIMONENE Vent 133-13

$N = \frac{2,500,000}{10,000} = 250$ KN = 0.25

$Lw = 2.4 \times 10^{-5} \times 136 \times 0.056 \times 250 \times 0.25 \times 1 \times 10,000 = 114.24$ lbs/yr.

ALPHA PINENE/MYRCENE Vent 133-14
N = 107500/2,500 = 43 KN = 0.8
$Lw = 2.4 \times 10^{-5} \times 136 \times 0.113 \times 43 \times 0.8 \times 1 \times 2,500 =$ 31.72 lbs/yr
Alpha Pinene = 19.1 lbs/yr
Myrcene = 12.7 lbs/yr

ALPHA TERPINEOL Vent 133-15
N = 67,500/2,500 = L7 KN = 1
$Lw = 2.4 \times 10^{-5} \times 154 \times 0.003 \times 27 \times 1 \times 1 \times 2500 = 0.75$ lbs/yr.

Total VOC Working Losses 147 lbs/yr.

BREATHING AND WORKING LOSSES EMISSION SUMMARY

	Lbs/Hr	Lbs/Yr
Alpha Pinene	0.0041	36
Myrcene	0.0027	24
Limonene	0.0188	164
Alpha Terpineol	0.0005	4
Total VOC	0.0261	228

APPENDIX VII

Emission Increase Summary (controlled Emissions)

A. Distillation Process Vents 133-11, 133-12

	Lbs/Hr	Tons/Yr
Alpha Pinene	1.032	4.33
Myrcene	1.003	4.21
Limonene	1.632	6.86
Xylene	10.06	1.69
Total	13.727	17.09

B. Tankage Breathing and Working Losses
Vents 133-13, 133-14, 133-15

	Lbs/Hr	Tons/Yr
Limonene	0.0188	0.082
Alpha Pinene	0.0047	0.018
Myrcene	0.0027	0.012
Alpha Terpineol	0.0005	0.002
Total	0.0267	0.114

APPENDIX VIII

UNCONTROLLED EMISSIONS SUMMARY
Vents 133-11 133-12

	Tons/Yr
Alpha Pinene	63.25
Myrcene	66.67
Limonene	151.50
Xylene	9.20
Total	290.57

Controlled Emissions per Appendix VII = 17.09 tons/yr.

$$\% \text{ Reduction} = \frac{290.51 - 17.09}{290.51} = 94.12\%$$

APPENDIX IX

SECTION V: SUPPLEMENTAL REQUIREMENTS

Item 2. "Basis of Emission Estimates"

The emission estimates are obtained from calculation of the vapor-liquid equilibrium. The method used combines the use of Dalton's and Raoult's Law.

Dalton's Law $P = \Sigma Pp$

Raoult's Law $Pp = PvX$

Pp = Partial Pressure
P = Total (system) pressure
Pv = Vapor Pressure
y = Vapor Mole Fraction
x = Liquid Mole Fraction

The use of a Heliflow heat exchanger (see attached product literature under Item No. 4) for the ejector after condenser will minimize the emission of organic vapors.

After construction a performance test will be conducted for each process emission vent prior to submitting an application to operate.

Item 3 "Basis of Potential Emissions Determination"

The potential emissions are based on that the ejector after condenser would not be functioning, due to loss of cooling water. The discharge of the ejectors would not be condensed and would then be discharged to the atmosphere.

In the case of cooling water failure the Limonene distillation would be shut down. The unit cannot operate without cooling water. The potential emission would occur for very short periods of time, less than one hour, in the event of cooling water loss.

Item 4. "Design Details of Air Control Equipment"

The selected air emission control system is a Graham Heliflow Cooler/Condenser, See attached manufacturer's literature describing the general features of the Heliflow heat exchangers.

The model selected is the 10 x F18ST which will provide 19.4 sq.ft. surface area. It will condense and cool the ejector vapors to $120^{\circ}F$.

Item 5. "Derivation of Control Device Efficiency"

The selected control device is the Graham Heliflow condenser. The efficiency of the control device, the Heliflow condenser, is based on condensing the vacuum ejector vapor discharge.

Efficiency = 94.12% (See Appendix VIII).

Item 6. "8 1/2 x 11 Process Flow Diagram"

See attached Process Flow Sketch SKA-2058.

Item 7. "8 1/2 x 11 Plant Location Plot Plan"

See attached section from USGS Pensacola Quadrangle.

Item 8. "8 1/2 x 11 Process Location Plant Plan"

See attached Plot Plan Building No. 133 Limonene Distillation, SKA-2059.

Item 9. "Application Fee"

A check for $100 based on potential emission of VOC less than 25 ton/yr made out to the State of Florida "Department of Environmental Regulation" is attached with this permit to construct application.

Item 10. Not Applicable

SECTION V
ITEM 6: "PROCESS DESCRIPTION"
LIMONENE DISTILLATION

Refer to attached drawing SKA-2058.

The process basically consists of two fractionating columns operating in series at approximately 25mm Hg. absolute pressure (28.9 inches vacuum).

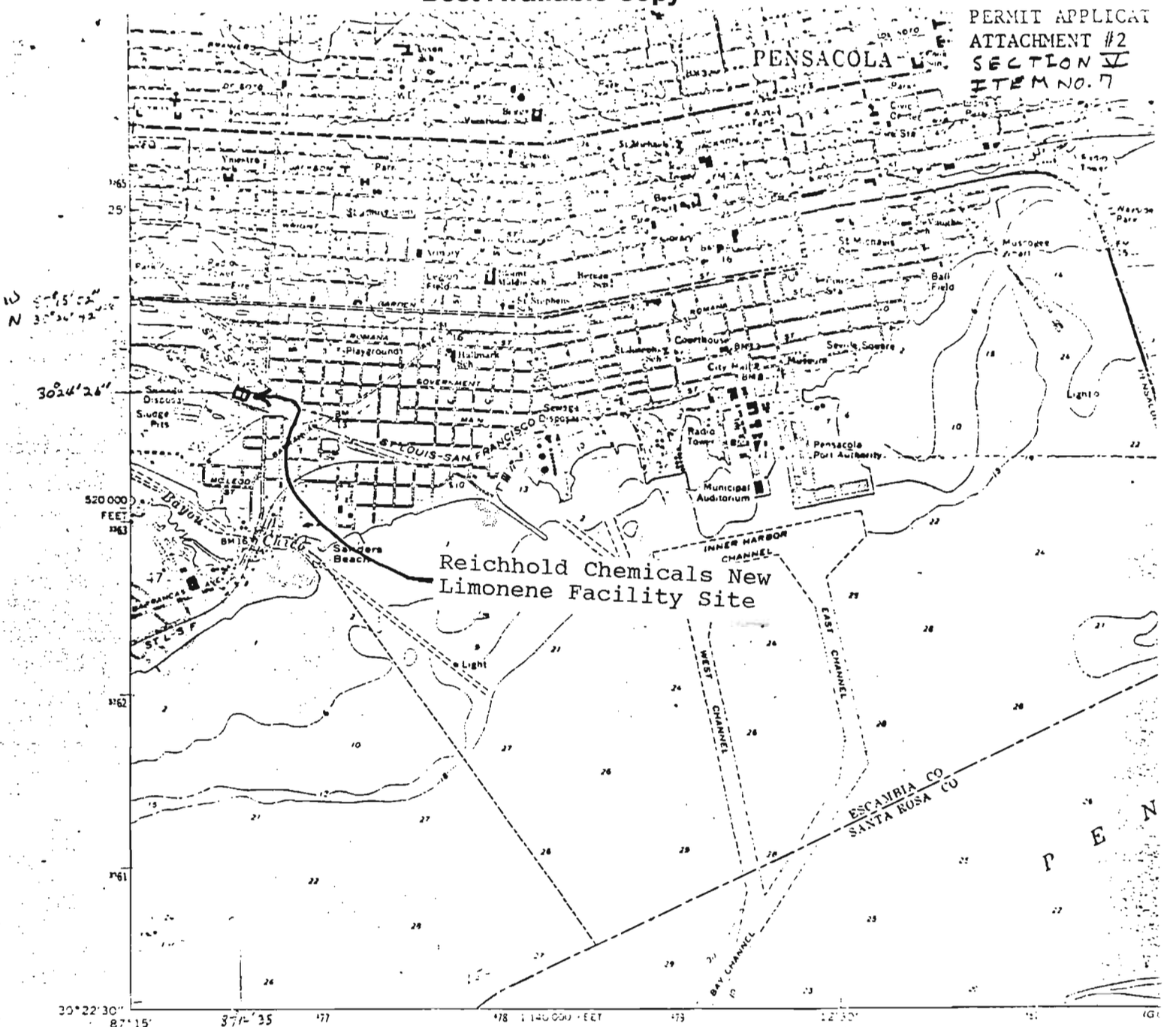
Crude limonene is pumped continuously into the first or light ends tower where low-boiling compounds including alpha pinene and myrcene are concentrated and removed as the overhead from the column.

The tower bottoms are continuously pumped to the second or product column where the product limonene is removed as the overhead and a small amount of residual bottoms removed and stored for future use or as fuel.

On an intermittent basis, 336 hours per year, the light ends fractionating column is used to purify the solvent xylene used in the manufacture of polyterpene resins, the end product for which limonene is used as the raw material. The xylene is removed as an overhead while the contaminates consisting of para cymene and limonene are removed as bottoms.

Best Available Copy

PERMIT APPLICAT
ATTACHMENT #2
SECTION V
ITEM NO. 7



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken January 1965, March 1965 and January 1966
Field checked 1970

Selected hydrographic data compiled from USC&GS Charts 490 and 1265 (1969)
This information is not intended for navigational purposes

Polyconic projection. 1927 North American datum
10,000 foot grid based on Florida coordinate system, north zone
1000-meter Universal Transverse Mercator grid ticks
zone 16, shown in blue

Red tint indicates areas in which only landmark buildings are shown

CONTOUR
DATUM
DEPTH CURVES AND SOUNDING
THE MEAN RANGE O

THIS MAP COMPLIES WITH
FOR SALE BY U S GEOLOGI
A FOLDER DESCRIBING TOPOGRAPHIC

SECTION V
ITEM 7
USGS PENSACOLA QUADRANGLE

AF 11205

- INPUT @ CAPACITY
60000 LBS/DAY
(2500 LBS/HR)

VENT 133-11
2.12 LBS/HR

VENT 133-12
1.541 LBS/HR

VENT 133-13
0.0188 LBS/HR

VENT 133-14
0.0074 LBS/HR

VENT 133-15
0.0005 LBS/HR

STEAM

WATER

FEED
CRUDE
LIMONENE

LIGHT ENDS COLUMN

CONDENSER

OVERHEAD RECEIVER

PIC

REBOILER

EJECTOR AFTER CONDENSER

PRODUCT COLUMN

PRODUCT TANK

HEADS TANK

BOTTOMS TANK

PRODUCT-LIMONENE

LOW-BOILERS

HIGH-BOILERS

PLANT PROCESS SEWER

PLANT WASTE W'TR PRE TREATMENT

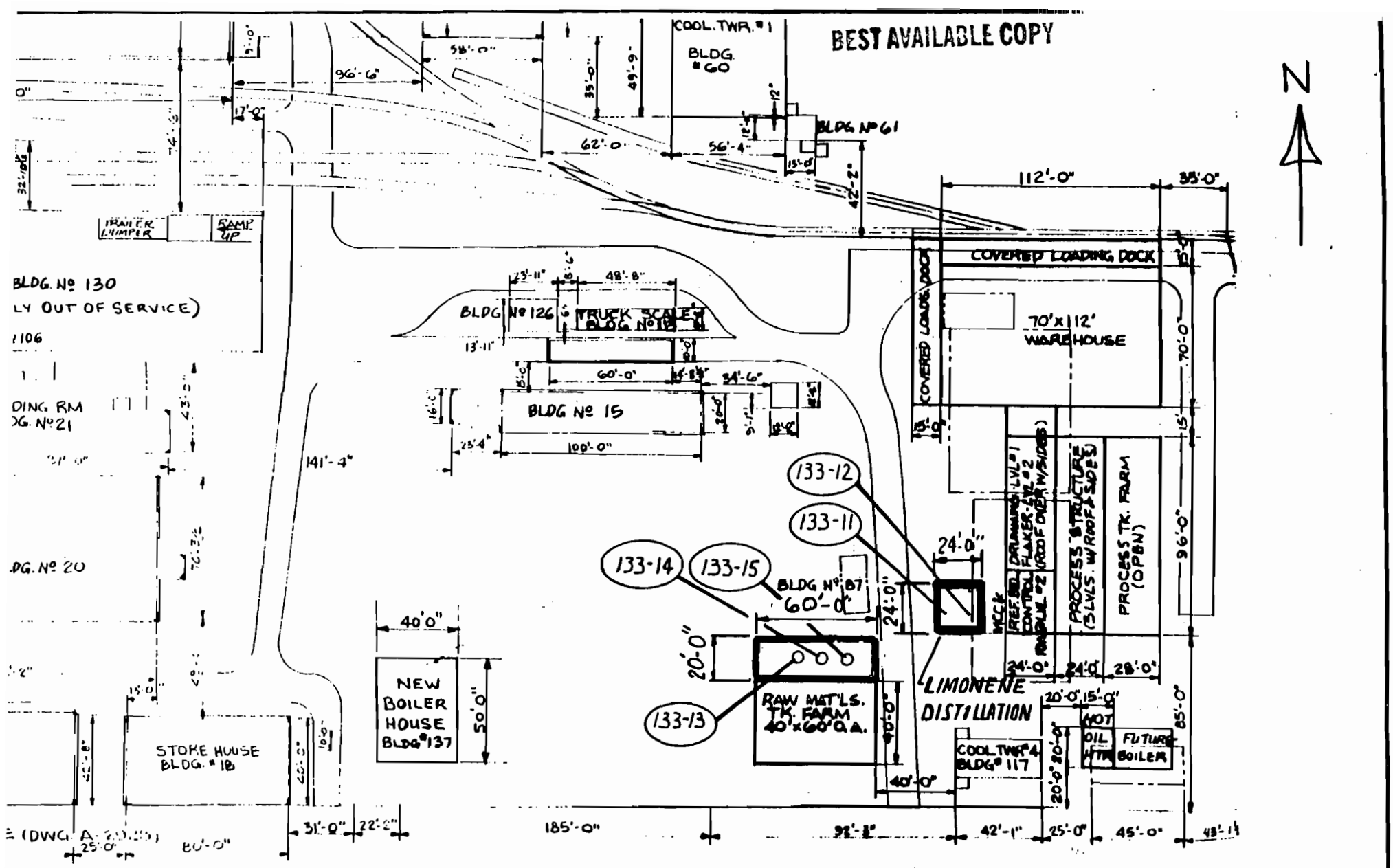
NO.	DATE	REVISIONS	DR.	ENG.	APP.
3					
2					
1					

REICHHOLD CHEMICALS, INC.

PROCESS FLOW
LIMONENE PLANT

DR. DMM | ENG. AHK | APPD

DATE 9-25-86 | SCALE NONE | SKA 2058



APPLICATION TO CONSTRUCT
SECTION V: ITEM 8

matters which
Chemicals, Inc.
e or disclosure
r authorization
on.

NO.	DATE	REVISIONS	DR.	ENG.	APP.
3					
2					
1					

RCI REICHHOLD CHEMICALS, INC.

PLOT PLAN - BLDG No. 133
LIMONENE DISTILLATION

DR. Dan | ENG. | APPD.
DATE 4-8-86 | SCALE — | SKA 205.9

APPENDIX X

INDUSTRIAL MANUFACTURING PROCESSES
Reichhold Chemicals, Inc.
Pensacola, Florida

The industrial manufacturing processes at Pensacola consist of chemical reaction processes that produce the following:

(a) Polyterpene resins.
(b) Synthetic resins from modified wood and tall oil rosin.
(c) Alkyd resins from various vegetable oils and fatty acids.
(d) Epoxy resins and hardeners.
(e) Rosin esters.

APPENDIX X1

AIR EMMISSION INVENTORY

Permit No.	Process	Pollutant	TPY Actual	TPY Potential
A017-81419	* Industrial Steam Boiler #8	Particulates	*0	72.4
A017-81423	* Industrial Steam Boiler #9	Particulates	*0	90.5
A017-81424	Industrial Steam Boiler #10	Particulates	147.2	153.1
A017-93688	Dowtherm Heater #1 3 Million BTU/Hr Max Input Natural Gas Only	Particulates NOx HC SO2	.044 .375 .100 .001	.048 .406 .108 .0011
A017-93689	Dowtherm Heater #2 3 Million BTU/Hr Max Input Natural Gas Only	Particulates NOx HC SO2	.037 .312 .083 .001	.040 .338 .09 .0011
A017-93690	Reactor #7 Furnace 6 Million BTU/Hr Natural Gas Only	Particulates NOx HC SO2	.055 .363 .122 .002	.220 .45 .488 .008
A017-81422	Resin Flaking & Bagging Building #65	Particulates Resin Dust	0.42	14.2
A017-73934	Resin Flaking & Bagging Building #56	Particulates Resin Dust	0.88	13.7
A017-73937	Resin Crushing & Bagging Building #91	Particulates Resin Dust	.052	5.2
A017-60662	Flaker Baghouse - South Plant Flaking & Crushing	Particulates Resin Dust	.36	36

Air Emission Inventory (continued)

Permit No.	Process	Pollutant	Emissions Actual	Emissions Potential
A017-81420	Polyterpene Resin Process	Hydrocarbons	86.9 TPY	96.6 TPY

Hydrocarbon Generic Name	Dimer Mixed Aromatic/ Aliphatic HC	Toluene Aromatic HC	VM&P Naphtha Aliphatic HC	Limonene Monocyclic Terpene HC	Alpha & Beta Pinene Bicyclic Terpene HC
Vapor Pressure	<0.003mm @ 100°F	22mm Hg @ 68°F	15mm Hg @ 100°F	3.5mm Hg @ 100°F	9mm Hg @ 100°F

Permit No.	Process	Pollutant	Emissions Actual	Emissions Potential
A017-73935	Zinc Resinate Process	Hydrocarbons	19.8 TPY	52.65 TPY

Hydrocarbon Generic Name - Mineral Spirits, Aliphatic HC
Rosin Oil, Disproportionated Wood Rosin
Vapor Pressure - 1.4mm Hg @ 70°F
.003mm Hg @ 100°F

Permit No.	Process	Pollutant	Emissions Actual	Emissions Potential
A017-73935	Organic Coatings Process	Hydrocarbons	8.75 TPY	50.5 TPY

Hydrocarbon Generic Name	VM&P Aliphatic HC	Mineral Spirits Aliphatic HC	Vinyl Toluene Aromatic HC
Vapor Pressure	15mm Hg @ 100°F	1.4mm Hg @ 20°F	1.1 mm Hg @ 68°F

Permit No.	Process	Pollutant	Emissions Actual	Emissions Potential
A017-73933	Terpene-Phenol Resin Process	Hydrocarbons	67.8 TPY	72.0 TPY

Hydrocarbon Generic Name	Alpha Pinene Terpene HC	Toluene Aromatic HC	VM&P Naphtha Aliphatic HC	Phenol Aromatic HC	Dimer Mixed Aro/Ali HC
Vapor Pressure	9 mm Hg @ 100°F	22 mm Hg @ 68°F	15mm Hg @ 100°F	0.1mm Hg @ 68°F	<0.05mm Hg @ 100°C

Permit No.	Process	Pollutant	Emissions Actual	Emissions Potential
A017-81421	* Paramenthane Hydroperoxide Process	Hydrocarbons	*0 TPY	39.8 TPY

Hydrocarbon Generic Name - Paramenthane, Terpene HC
Vapor Pressure - 7 mm Hg @ 100°F

Air Emission Inventory (continued)

Permit No.	Process	Pollutant	TPY Actual	TPY Potential
A017-93677	South Plant Main Process Scrubber	Odors	Not Quantified in Permit	
A017-93686	R-1 Reactor Scrubber	Odors	Not Quantified in Permit	
A017-93687	R-2 Reactor Scrubber	Odors	Not Quantified in Permit	
A017-93683	*Flaker System Hood	Heat & Traces of Hydrocarbons (Resin Oils)	*0	

* These units for standby only.

NOTE: A new Polyterpene process has been permitted for construction but is not yet in operation.

AC17098127
AC17104265

Net hydrocarbon and particulate emissions will reduce when the new unit is in full production and the old unit is shut down.

APPENDIX XII

CURRENT TOTAL EMISSION FOR PENSACOLA FACILITY

	TPY Actual	TPY Potential
Particulates	149.05	385.4
Hydrocarbons	183.60	311.6
NO^x	1.05	1.2
SO^2	0.004	0.01

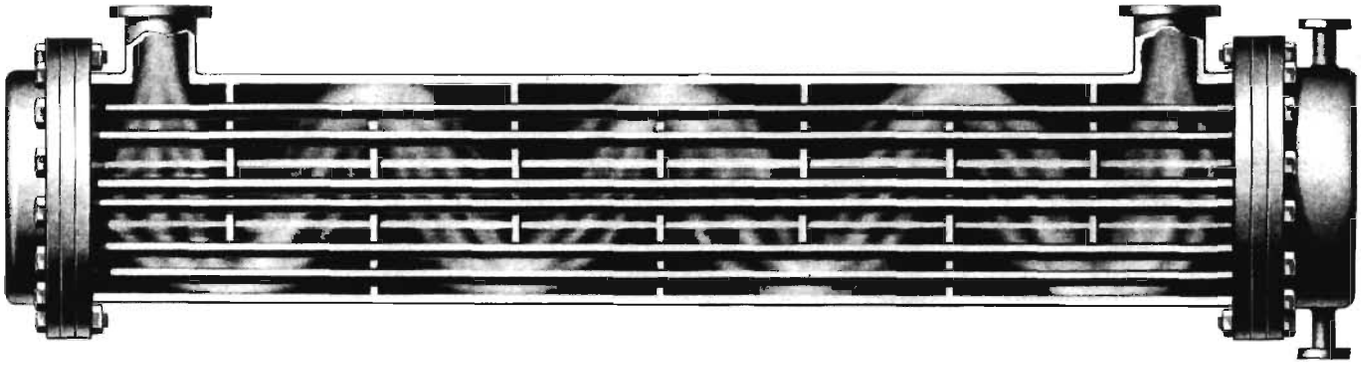
HOW THE HELIFLOW OPERATES

There are no inactive areas in the Heliflow. Because of the flow pattern inherent in its spiral coil design, dead spaces do not exist and an accurate constant velocity is maintained throughout the path of flow around and through each coil.

Furthermore, the unit may be designed for any velocity required, regardless of how small the quantities of fluid. There is no need for close baffle spacing and small tubes which, in the conventional straight tube exchanger, make it difficult to clean either the tube or the shell side.

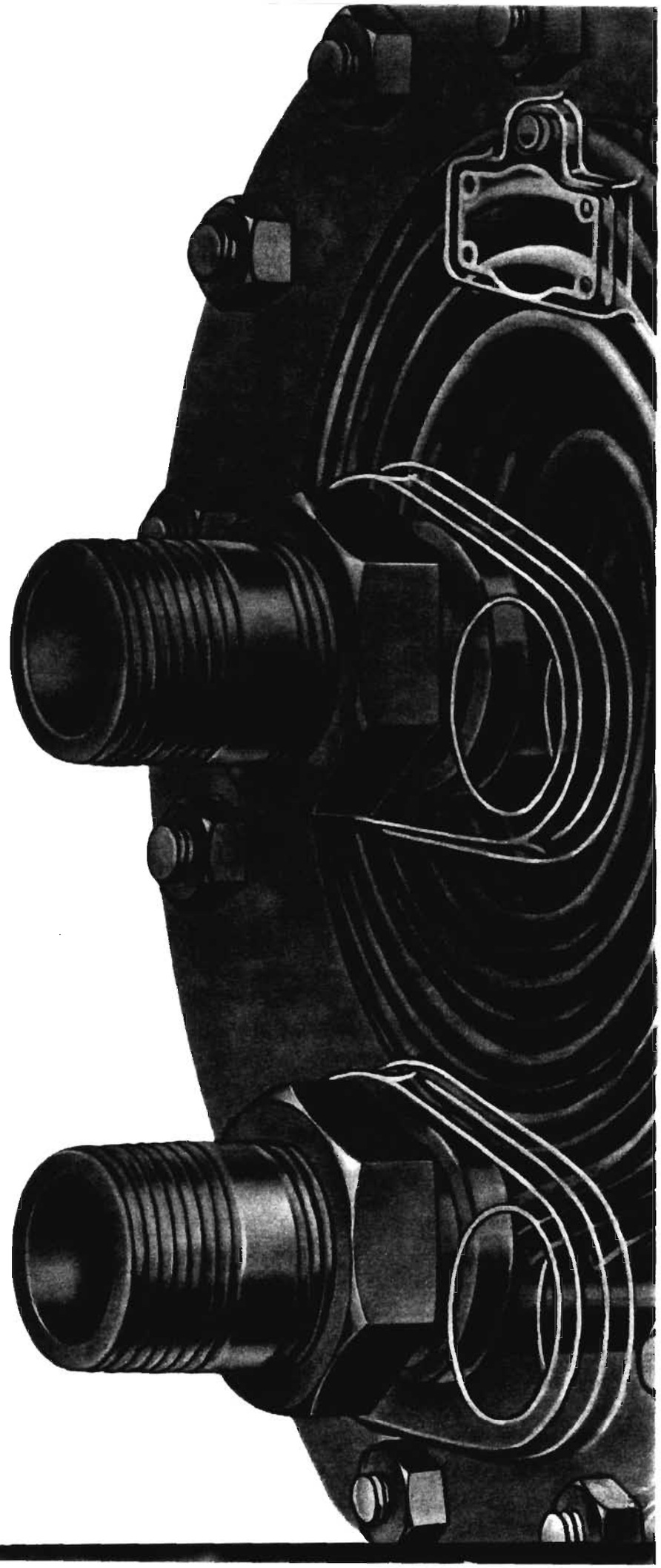
Any velocity may be attained by varying the pitch of the coils or using multiple coils in parallel. Due to the spiral counterflow, and proper velocities of both the heating and cooling media, efficient utilization of the heat transfer surface is obtained under all conditions.

Another outstanding feature of the Heliflow is the fact that the absence of frequent sharp turns in the path of flow and the elimination of baffles mean that pressure drop is held to a minimum. All pressure drop energy is expended in attacking the tubes, thus creating natural turbulence at the point of heat absorption, rather than dissipating a part of this energy on baffles which do not transfer heat.



Heliflow advantages

1. Heliflow heat exchangers will transfer heat at a rate up to 40% greater than an equivalent straight-tube heat exchanger.
2. Because it is so efficient, the Heliflow heat exchanger is compact, and lightweight. It can be hung from ceiling, column or wall, on the side of an engine or other piece of equipment, or floor-mounted. It fits in locations where a straight-tube heat exchanger wouldn't. And it involves no draining problem.
3. Throughout the Heliflow heat exchanger, each fluid flows in a direction opposite to that of the other. It is a 100% counterflow design. Temperature crossing is not a problem, and close temperature approach can be maintained.
4. The coil exterior is completely exposed when the casing is removed, and thus easy to clean.
5. No matter how small the design rate of flow, correct fluid flow velocity can be designed, and maintained, in a Heliflow heat exchanger.
6. In contrast to designs involving tubes and tube sheets, Heliflow heat exchangers have a minimum number of joints in the service and process fluid circuits, further reducing the possibility of leakage.
7. Heliflow design avoids thermal expansion problems. In small straight-tube heat exchangers with fixed heads, tubes are subject to thermal expansion strain. Tube life is shortened, and leakage at the tube sheet is common. The Heliflow element, with its spring-like coil, absorbs thermal expansion without putting strain on the inlet and outlet tube connections. Leakage is rare and service life is excellent.
8. The Heliflow heat exchanger is precision-built in a wide variety of types, sizes, and materials. If there are special needs for which no existing Heliflow model is suited, inquiries for custom designs are invited.
9. The remarkably compact and efficient Heliflow heat exchanger is the result of years of continuing development, and has proven itself in years of service in a wide variety of applications.



TYPES OF HELIFLOW APPLICATIONS

Lubricating Oil Coolers
The Heliflow is ideal for cooling lubricating oil for engines, turbine bearings, reduction gears, etc. Oil is circulated through the coil, and the internal fin tube is often used for a unit easily adapted to extremely limited installation space. Cooling water circulates on the shell side, which is easily accessible for cleaning, without disturbing piping, by removing the cover.

Lubricating Oil Heaters and Oil Purifiers
The Heliflow is also ideal for heating lubricating oil so that it can readily flow through a filter. And Heliflow units are used for lubricating oil heaters in cold climates, where heating allows for speedy startup at low horsepower.

Blowdown Heat Exchangers and Feedwater Heaters
The Heliflow is widely used for blowdown heat exchange from boilers, evaporators, and other equipment that requires periodic discharge of hot fluid to a sump. Almost complete heat recovery is possible because of the Heliflow's true counterflow design. Incoming fresh feed is usually circulated through the coil, with blowdown liquid through the shell side. This allows for convenient cleaning when necessary.

Pump Seal Coolers
Modern mechanical seals used on medium and high-temperature pumps require that the seal fluid be cooled to insure proper operation of the seal and long maintenance-free life. The seal liquid is circulated through the Heliflow coil, and the cooling water on the shell side. Graham manufactures special Heliflow seal coolers for compact installations that are effective for seal fluid flows as small as 1 gpm.

Vent Condensers
A special Heliflow design is made for vent condenser application. It has a reverse-through manifold to handle large quantities of non-condensibles. This allows vent gases to pass through while vapors are condensed and drained to a proper seal tank, with low pressure drop on the vent side. The cooling water flows through the shell side.

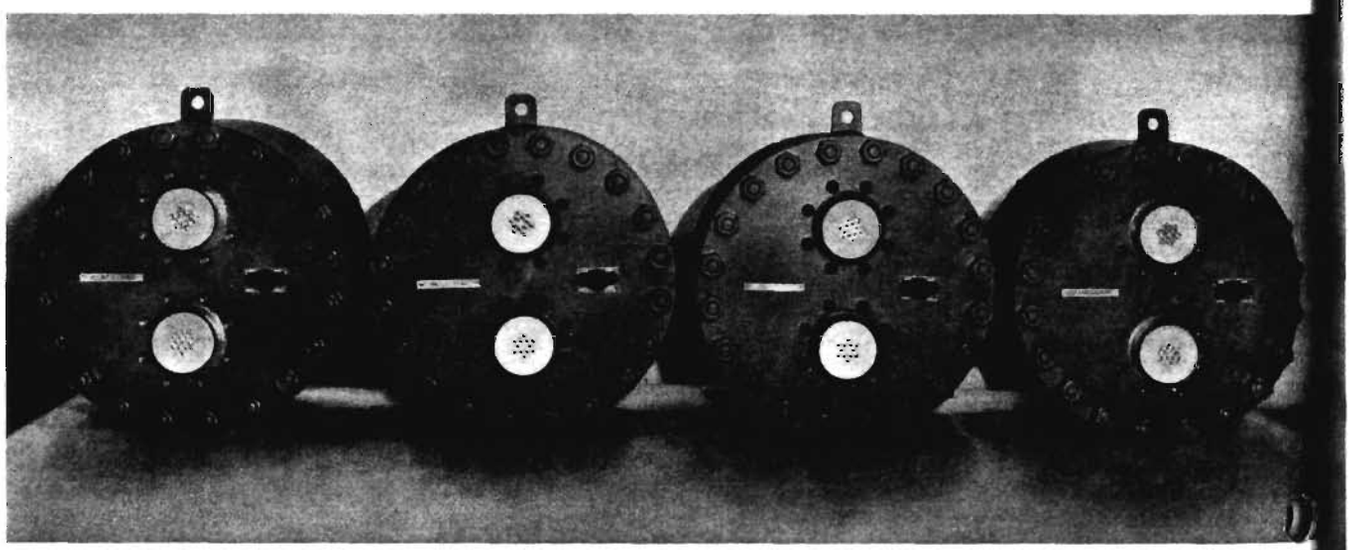
Process Condensers
The Heliflow is a compact and effective condenser for small process applications, using the through-manifold for complete separation of condensibles from a non-condensible gas stream. The arrangement and design provide for easy installation of an ejector for processes that operate below atmospheric pressure. For larger installations, Graham manufactures a special top-of-the-tower Heliflow condenser for maximum sub-cooling of non-condensible gas with minimum sub-cooling of condensate. The unit is for installation within the tower, with vapor condensing on the shell side while cooling water flows through the coil.

High Pressure Feed Heaters
The unique Heliflow design permits use of a standard unit for high pressure feed heaters. The feed flows through the coil with the heating medium on the shell side.

Sample Coolers
Thousands of Heliflow heat exchangers are sold every year for sample coolers. The standard sample cooler design will handle fluids from 100 to 5000 psig. These may be used for periodic or continuous sampling with the sample fluid in the coil and the cooling water on the shell side. A variety of alloys is available to meet any requirement.

Fuel Oil Heaters
Heliflow units require a minimum of piping, maintenance, and cleaning in fuel oil heater service. A particularly compact installation is possible with the external-fin tube Heliflow. Oil flows on the shell side so that the unit may be readily cleaned as often as the quality of the fuel requires.

Engine Jacket Water Coolers
The unique construction and compact size of the Heliflow make it convenient to install for jacket water for engines and compressors, and other closed-circuit cooling. The non-fouling jacket water circulates through the coil while cooling water flows on the shell side. The compact Heliflow is easily fitted into unused space without adding to the overall dimensions of the equipment.



These acid coolers utilize Hasteloy X on the tube side for heat corrosion resistance.

ENGINEERING DATA (SIZES 4-10 to 45-20LL)

Size	Number of Coils	Surface Sq. Feet	Tube Diam. Inches	Coil Spacing Inches	Free Shell Area Sq. Inches	Coil Length Feet
4-10	4	1.44	3/8	1/8	.309	3.67
8-10	8	2.56	1/4	1/8	.358	4.92
4-12	4	2.75	1/2	1/8	.466	5.25
6-12	6	4.13	1/2	1/8	.699	5.25
8-12	8	4.40	3/8	1/8	.618	5.51
12-12	12	6.31	1/4	1/8	.537	8.11
9-14S	9	9.63	1/2	1/8	1.04	8.16
12-14S	12	11.6	3/8	1/8	.93	9.90
18-14S	18	11.5	1/4	3/16	1.08	9.77
12-14L	12	13.0	5/8	1/8	1.94	6.6
15-14L	15	16.0	1/2	1/8	1.75	8.16
20-14L	20	19.4	3/8	1/8	1.55	9.90
30-14L	30	19.2	1/4	3/16	1.8	9.77
30-14LL	30	32.08	1/2	1/8	3.50	8.16
9-16S	9	12.7	1/2	1/8	1.04	10.88
12-16S	12	17.4	3/8	1/8	.93	14.79
18-16S	18	17.66	1/4	3/16	1.08	15.06
10-16L	10	15.9	3/4	3/16	2.62	8.12
12-16L	12	16.6	5/8	3/16	2.42	8.46
15-16L	15	20.9	1/2	3/16	2.23	10.62
20-16L	20	21.5	3/8	1/4	2.48	10.98
30-16L	30	29.5	1/4	3/16	1.80	15.06
30-16LL	30	41.72	1/2	3/16	4.45	8.46
10-18S	10	19.4	3/4	1/4	3.09	9.92
12-18S	12	24.0	5/8	1/4	2.88	12.20
15-18S	15	24.5	1/2	1/4	2.68	12.40
20-18S	20	25.2	3/8	5/16	2.95	12.87
20-18L	20	39.2	3/4	1/4	6.16	9.87
24-18L	24	48.0	5/8	1/4	5.76	12.20
30-18L	30	48.9	1/2	1/4	5.37	12.38
45-18LL	45	73.02	1/2	1/4	8.03	12.38
10-20S	10	27.0	3/4	1/4	3.09	13.78
12-20S	12	31.3	5/8	1/4	2.88	15.93
15-20S	15	31.9	1/2	1/4	2.68	16.25
20-20S	20	32.2	3/8	5/16	2.95	16.42
20-20L	20	54.0	3/4	1/4	6.16	13.78
24-20L	24	62.6	5/8	1/4	5.76	15.93
30-20L	30	63.8	1/2	1/4	5.37	16.25
45-20LL	45	95.72	1/2	1/4	8.03	16.25

Connections Casing-Coil		GPM at Velocity of 10 FPS				Shell Equiv. Flow Lgth., Feet	Size
		Casing	Coil—BWG				
			16	18	20		
	½	9.65	—	7.5	—	5.35	4-10
	½	11.1	2.8	4.5	6.3	5.7	8-10
1	1¼	14.5	13.4	15.8	18.1	6.5	4-12
1	1¼	21.8	20.1	23.7	27.1	6.5	6-12
1	1¼	19.3	11.7	15.0	18.2	7.9	8-12
1	1¼	16.8	4.3	6.8	9.5	9.4	12-12
	1¼	32.8	30.1	35.5	40.6	9.75	9-14S
	1¼	29.0	17.6	22.5	27.3	11.5	12-14S
	1¼	33.8	6.4	10.2	14.3	11.5	18-14S
	1¼	61.0	72.1	82.0	—	8.25	12-14L
	1¼	56.4	50.2	59.3	67.8	9.75	15-14L
	1¼	48.3	29.3	37.4	45.5	11.5	20-14L
	1¼	56.9	10.7	17.0	23.8	11.5	30-14L
	1¼	109.0	100.0	118.0	136.0	9.75	30-14LL
	2	32.8	30.1	35.5	40.6	13.0	9-16S
	2	29.0	17.6	22.5	27.3	15.5	12-16S
	2	33.8	6.4	10.2	14.3	17.5	18-16S
	2	81.5	94.3	104.0	—	9.7	10-16L
	2	75.5	72.1	82.0	—	11.6	12-16L
	2	69.5	50.2	59.3	67.8	12.75	15-16L
	2	77.4	29.3	37.4	45.5	13.1	20-16L
	2	56.9	10.7	17.0	23.8	17.3	30-16L
	2	139.0	100.0	118.0	136.0	11.6	30-16LL
	2½	96.3	94.3	104.0	—	12.3	10-18S
	2½	89.7	72.1	82.0	—	14.5	12-18S
	2½	83.5	50.2	59.3	67.8	14.9	15-18S
	2½	92.0	29.3	37.4	45.5	15.5	20-18S
	2½	193.0	188.0	208.0	—	12.3	20-18L
	2½	180.0	145.0	163.0	—	14.5	24-18L
	2½	168.0	101.0	119.0	136.0	14.9	30-18L
	2½	250.0	150.0	178.0	203.0	14.9	45-18LL
	2½	96.3	94.3	104.0	—	17.1	10-20S
	2½	89.7	72.1	82.0	—	18.95	12-20S
	2½	83.5	50.2	59.3	67.8	19.5	15-20S
	2½	92.0	29.3	37.4	45.5	16.6	20-20S
	2½	193.0	188.0	208.0	—	17.1	20-20L
	2½	180.0	145.0	163.0	—	18.95	24-20L
	2½	168.0	101.0	119.0	136.0	19.5	30-20L
	2½	250.0	150.0	178.0	203.0	19.5	45-20LL