



UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS

P.O. BOX 37, DENVILLE, TEXAS 77590

December 14, 1976

Mr. Jim Tarr
Texas Air Control Board
Region VII Office
5555 West Loop, Suite 300
Bellaire, TX 77401

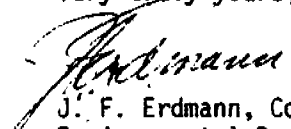
Dear Jim:

SUBJECT: Leak Detection Program for Vinyl Resin Production Units,
Texas City Plant

In furtherance of our agreement to keep you informed of our reporting to EPA under the new VCM Regulation, attached is a copy of the Leak Detection Program report required within 45 days by subject regulation.

If you have any questions, please call me.

Very truly yours,


J. F. Erdmann, Coordinator ✓
Environmental Protection Dept.
(713) 945-7411, Ext. 1126

JFE/cew
Attachment

bcc: Mr. J. B. Leverton
Mr. F. S. Provenzano

UCC
060645



*JFE - Have you seen?
Keep in your files*

UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS

P.O. BOX 8004, SOUTH CHARLESTON, W. VA. 25303

RECEIVED
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JBL

SOUTH CHARLESTON PLANT

December 3, 1976

Mr. Abraham Ferdas
Environmental Protection Agency
Region III Curtis Building 2nd Floor
6th & Walnut Streets
Philadelphia, Pennsylvania 19106

Ref: Memo, J. L. Worstell
to Abraham Ferdas,
November 21, 1976

Dear Mr. Ferdas:

In accordance with the recently promulgated emission standards for vinyl chloride, the attached description of the required leak detection and elimination program (§61.65 (b) (8)) is submitted for approval by the Administrator.

Very truly yours,

J. L. Worstell

J. L. Worstell
Environmental Protection
Coordinator

JLW/pl

Attachment

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060646

NATIONAL EMISSION STANDARD FOR VINYL CHLORIDE

61.65 (b) (8) Leak Detection and Elimination Program

* Union Carbide Corporation
South Charleston, West Virginia

Objectives

1. Prevent leaks by preventive maintenance and good work procedures.
2. Discover and repair accidental leaks, i.e., leaks not controllable by preventive maintenance and good work procedures.
3. Keep adequate records to demonstrate to E.P.A. that Union Carbide Corporation is in compliance with the E.P.A. regulation.

Program

I. Prevent Leaks

1. All major equipment in vinyl chloride service is inspected by trained process safety inspectors on an annual basis. This inspection includes tests for metal loss, weld failure and structural integrity. Hydrostatic strength tests are made at regular intervals even in the absence of faults revealed by inspection.
2. Faulty valves are removed, disassembled, work parts replaced, reassembled and leak tested prior to reinstallation.
3. Relief valves are inspected monthly. Relief valves are removed, cleaned, seats lapped, reset, tested for leaks and reinstalled on an annual basis.

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Program (continued)

I. Prevent Leaks (continued)

4. Relief valves that have relieved are removed, cleaned, seats lapped, reset, tested for leaks and are reinstalled promptly.
5. Rupture discs are inspected regularly and are replaced at two-year intervals.
6. Disassembled pipe and equipment flanges are cleaned, regasketed with new gaskets and reassembled.
7. All pipelines in vinyl chloride service are inspected externally for evidence of corrosion failure on an annual basis, particularly in areas where the pipe is supported by hangers and structure and where flanged joints appear. This thorough inspection by skilled Process Safety Inspectors is in addition to inspections by operating personnel.
8. Installed spare equipment such as pumps and compressors is provided so that leaking or poorly operating items can be removed from service promptly for repair.
9. Material in process inventories are managed so that vessels in vinyl chloride service can be removed from service and emptied promptly if leaks develop.
10. Equipment and pipelines are leak tested with inert gas after disassembly for cleaning and repair.
11. Operating personnel are trained in the hazards of vinyl chloride and in the methods and work procedures to minimize emissions.

Program (continued)

II. Discover and Repair Accidental Leaks

A. Fixed vinyl chloride monitoring systems

Union Carbide Corporation, after a thorough study of available monitoring systems, chose to build its own systems. The purchased systems generally did not meet internally developed selection standards for sensitivity, precision, specificity, cost, maintenance and delivery time.

The monitoring system in use is identified as a Union Carbide Corporation Model 1200 automatic chromatograph. The unit consists of a three-column chromatograph with a flame ionization detector requiring two minutes to analyze an air sample to a sensitivity of 0.05 ppm vinyl chloride. The system analyzes samples taken from 19 points and checks its calibration against a standard sample every forty minutes. Visible and/or audible alarms are automatically actuated when the VCM concentration exceeds 5 ppm in any sample, when the calibration sample analysis fails to check, when sample flow is inadequate and when the unit is over ranged (> 25 ppm). Output data is collected and correlated by a computer and the results printed on an automatic typewriter. Three of these systems are used to monitor work space, leak and vent emission concentration at the South Charleston, West Virginia Plant.

The automatic chromatograph system is routinely checked by the instrument mechanic daily (or more frequently) for

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

A. Fixed vinyl Chloride monitoring system (continued)

proper operation. Faulty parts are replaced promptly. Since the system checks itself each cycle, little or no manual testing is required to provide essentially 100% availability. These systems have been functioning since mid-1974.

The output print from the automatic typewriter showing the individual analysis for each point, time and summary data are filed daily for the record along with appropriate information on point location.

- B. A "leak" defined in terms of the fixed monitor data is a significant departure from the average background vinyl chloride concentration in the plant. The average background concentration is less than 1 ppm and the standard deviation for the average is 2 ppm. Compensating for the skewed distribution curve requires the arbitrary use of a change of over four standard deviations to indicate a significant change, a leak is defined as two consecutive analysis of a single point showing 10 ppm or more vinyl chloride concentration. An analysis of 25 ppm or more requires emergency procedures. Leaks are also indicated by the sound of the emission, frosting at the leak point, visible gas emission and process controls. These other characteristics of a leak are obvious and presumably do not need formal definition.

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

C. Portable Leak Detector

Two Century Organic Vapor Analyzers Model OVA98B are used for locating leak sources when leaks are indicated by the fixed monitor or area studies are made to check the integrity of operating, procedures and equipment. The Century OVA analyzer has a sensitivity of approximately 1 ppm for organic vapors. Specificity, while desirable is not required since once the leak is located the source of the leak gives an indication of leak composition.

The Century OVA operating procedure provides for routine tests of the battery and the indicator span and zero with each use. The Century OVA is tested with a standard air sample containing 100 ppm methane daily. Stable vinyl chloride air samples cannot be prepared and nitrogen vinyl chloride samples upset the instrument detector.

Union Carbide Corporation, South Charleston Plant, utilizes a computerized preventive maintenance program (RM-1) to periodically recall a variety of electronic instruments, used for safety/environmental measurements, into the plant instrument shop for inspection, any necessary adjustments or repairs and calibration. The computerized program provides means for notification when inspections are due and for maintaining individual historical records related to accuracy, reliability, maintenance.

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

C. Portable Leak Detector (continued)

nance, etc. Portable hydrocarbon detectors (Century OVA's) used in the plant vinyl chloride leak detection/elimination program are on a three (3) month RM-1 schedule.

In addition to the above program, weekly inspections of Century OVA's used in vinyl chloride leak detection/elimination are conducted by trained instrument mechanics on duty in immediate areas where these instruments are stored and used. Thus, quick service is available in the event of a malfunctioning portable hydrocarbon detector. Weekly inspections include the following check list which is essentially the instrument start up procedure plus calibration. (This same procedure is the standard operating procedure in preparing the instrument for actual use.)

STANDARD OPERATING PROCEDURE - CALIBRATION

1. Check instrument sampling pump by engaging pump switch.
2. Check indicator to assure that the battery is adequately charged.
3. Turn instrument switch on and allow five (5) minute warm-up.
4. Check calibration with "low" and "high" calibration switch.
5. Check sample flow rate indicator (rotometer) to assure sample flow.

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

C. Portable Leak Detector (continued)

6. Check hydrogen tank pressure gauge (0-300 psi) to assure adequate supply.
7. Open hydrogen tank valve and the hydrogen supply valve.
8. Ignite the burner per instrument instructions.
9. Insert the portable hydrocarbon detector sample probe through the valve stem and into a 5 - 10 liter TEDLAR bag containing 100 ppmv methane in air to assure instrument response. (100 ppmv methane in air is prepared in cylinders per the procedure described in a previously submitted equivalency determination application.)

D. Action Program for Accidental Leak Control

1. On indication of a leak or an alarm from the monitoring system, personnel are to put on respirators immediately or are to evacuate the area.
2. The source of the leak or the leak area will be announced over the public address system or the radio telephone system by the foreman or his deputy.
3. The designated operator, protected by a respirator, will proceed immediately to the leak area for an audible-visible survey.
4. If the designated operator can locate the leak source, then he effects repair if possible or requests help from the foreman and takes the pipe-

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

D. Action Program for Accidental Leak Control (continued)

line or equipment item out of service, i.e., prepares it for opening.

5. The foreman, if required, provides assistance via other personnel or summons maintenance personnel and makes repairs.
6. If the leak is not readily found by visible or audible means, the foreman sends the designated Century OVA operator to the area to survey the suspected area.
7. The Century OVA operator locates the leak and notifies the foreman who arranges for its repair.
8. On location and repair of the leak, the foreman or his deputy prepares a leak report noting the time of the leak, its location and its cause. He also describes the action taken to repair the leak and its current status. This report is signed by the foreman and filed daily as required by the regulation.
9. The manufacturing department head for the plant reviews leak reports regularly and takes further action if a leak is repetitive or there is indication of an underlying problem. The department head also acts to ensure the availability of trained Century OVA operators and of trained repair personnel.

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System

The vinyl chloride monitoring system at the South Charleston West Virginia Plant consists of three automatic chromatograph systems (See previous description) with a combined total of sample points of 57. These are used to accomplish three basic objectives.

- (a) Monitor the work space atmosphere as required by the Occupational Safety and Health Standard.
- (b) Leak detection as required by the Environmental Protection Administration Standard for Vinyl Chloride [§61.65 (b) (8)].
- (c) Monitor vinyl chloride control equipment emissions as required by the EPA Vinyl Chloride Standard [§61.68 (a)].

The location of the sample points was selected based upon Industrial Hygiene studies conducted by the plant and upon judgmental probability of emissions occurring at a specific location. Where vinyl chloride is frequently detected, or there is a high probability of VCM detection the sample point concentration is higher than areas where there is a low probability of a leak or an emission. The location of sample points is shown of Figures I and II which encompasses plant areas where vinyl chloride is transferred, stored or used. Figure I shows the unloading and storage

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System (continued)

area. Figure II shows the resin manufacturing area. Shaded areas show the location of equipment in vinyl chloride service.

A listing and description of the sample point locations is as follows:

Chromatograph No. 1

<u>Sample No.</u>	<u>Description</u>
1	Outside south end of polymerization and stripping building (Building 153).
2	Inside south end of polymerization and stripping building (Building 153).
3	Inside south center area of polymerization and stripping building (Building 153).
4	Inside north center area of polymerization and stripping building (Building 153).
5	Outside north west corner of polymerization and stripping building (Building 153).
6	Vent solvent scrubber area east of solvent recovery building (Building 154).
7	Inside north end of polymerization and stripping building (Building 153).
8	South end of polymerizer structure (Building 153).
9	South center area of polymerizer structure (Building 153).

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System (continued)

Chromatograph No. 1 (continued)

<u>Sample No.</u>	<u>Description</u>
10	North center area of polymerizer structure (Building 153).
11	North end of polymerizer structure (Building 153).
12	Vinyl chloride unit storage tanks (south tank area Building 154).
13	Building 191 control room area.
14	Building 154 control room area.
15	Vinyl chloride metering and storage tank area (south tank area Building 154).
16	Dilute solvents storage tank area south of Building 153.
17	Lower level of stripping area, polymerization and stripping building (Building 153).
18	Upper level of stripping area polymerization and stripping building (Building 153).
19	South east corner structure, solvent recovery building (Building 154).
20	Calibration gas sample cylinder.

Chromatograph No. 2

21	Resin slurry area, second level, resin processing building (Building 152).
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Program (continued)

II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System (continued)

Chromatograph No. 2 (continued)

<u>Sample No.</u>	<u>Description</u>
22	Supervisors offices, second level, resin processing building (Building 152).
23	Resin precipitation area, second level, resin processing building (Building 152).
24	Process control room, third level, resin processing building (Building 152).
25	Resin precipitation area, third level, resin processing building (Building 152).
26	Resin slurry area, third level, resin processing building (Building 152).
27	Resin testing laboratory area, third level, resin processing building (Building 152).
28	Resin solution storage area, tanks south of polymerization and stripping building (Building 153).
29	Process control room, fourth level, resin processing building (Building 152).
30	Resin wet grinder area, fourth level, resin processing building (Building 152).
31	Stack sample vent incineration system (Building 151).

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System (continued)

Chromatograph No. 2 (continued)

<u>Sample No.</u>	<u>Description</u>
32	North resin grinding area, fourth level, resin processing building (Building 152).
33	Center resin grinding area, fourth level, resin processing building (Building 152).
34	Gel processing area, fourth level, resin processing building (Building 152).
35	Clarifier area, fifth level, resin processing building (Building 152).
36	No. 1 primary centrifugal area, fifth level, resin processing building (Building 152).
37	No. 1 secondary centrifugal area, fifth level, resin processing building (Building 152).
38	Batch precipitator area, fifth level, resin processing building (Building 152).
39	Batch precipitator area, fifth level, resin processing building (Building 152).
40	Calibration gas sample cylinder.

Chromatograph No. 3

1N	North fence of bulk storage area at west end of tank car unloading station.
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Program (continued)

II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System (continued)

Chromatograph No. 3 (continued)

<u>Sample No.</u>	<u>Description</u>
2N	South end of tank car unloading station in bulk storage area.
3N	North fence of bulk storage area at center of tank car unloading station.
4N	Middle of tank car unloading station, bulk storage area.
5N	North fence at east end of tank car unload- ing station.
6N	Pipe rack at south east end of tank car unloading station, bulk storage area.
7N	Pipe rack at north west corner of tank No. 9030, bulk storage area.
8N	Pipe rack at north east corner of tank No. 9020, bulk storage area.
9N	Pipe rack at south east corner of tank No. 9020, bulk storage area.
10N	Pipe rack at south east corner of tank No. 9014, bulk storage area.
11N	Pipe rack at south west corner of tank No. 9016 (VCM tank), bulk storage area.
12N	Pipe rack at north west corner of tank No. 9016 (VCM tank), bulk storage area.

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System (continued)

Chromatograph No. 3 (continued)

<u>Sample No.</u>	<u>Description</u>
13N	Pipe rack at north east corner of tank No. 9016 (VCM tank), bulk storage area.
14N	Pipe rack at south east corner of tank No. 9016 (VCM tank), bulk storage area.
15N	Pipe rack west of tank No. 9016 (VCM tank) refrigeration unit, bulk storage area.
16N	Pipe rack east of tank No. 9016 (VCM tank) refrigeration unit, bulk storage area.
17N	North side of tank No. 9016 (VCM tank) refrigeration unit, bulk storage area.
18N	Underside of tank No. 9016 (VCM tank), bulk storage area.
19N	Western portion of bulk storage area near tank No. 9997.
20N	Calibration sample gas cylinder.

NOTE: The foregoing layout and description of sample points was in effect December 1, 1976. Union Carbide Corporation will relocate these points for greater effectiveness as monitoring results indicate a need.

Program (continued)

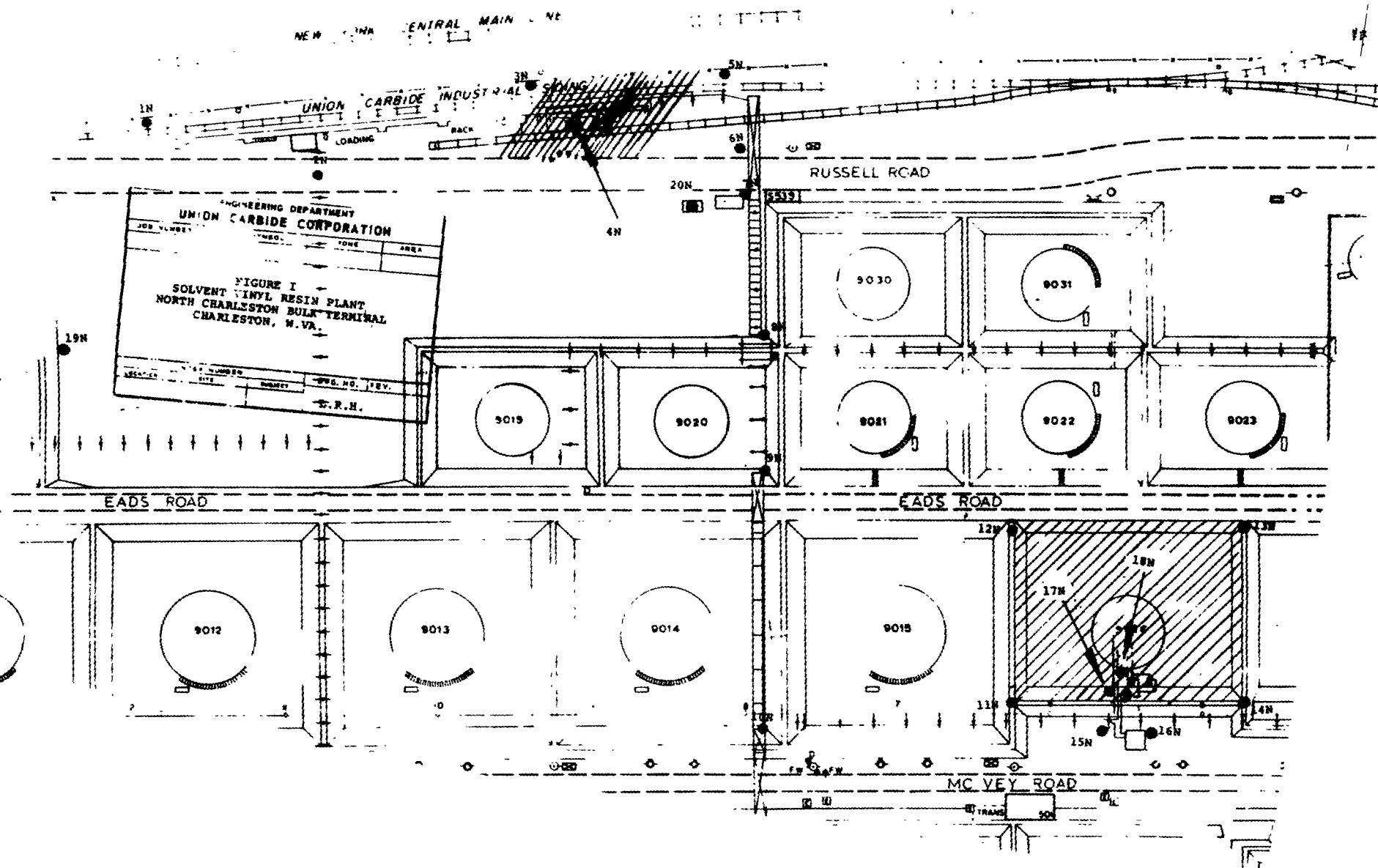
II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System (continued)

Major Plant Equipment in Vinyl Chloride Service \$61.65 (2)

<u>Item</u>	<u>Volumetric Capacity</u>
Railway Tank Cars	25 to 48,000 gallons
Tank Car Unloading Structure	NA
Storage Sphere (No. 9016)	430,000 gallons
No. 1 Polymerizer	10,000 gallons
No. 2 Polymerizer	10,000 gallons
No. 5 Polymerizer	10,000 gallons
No. 6 Polymerizer	10,000 gallons
Process Storage Tank (No. 2611)	8,200 gallons
Process Storage Tank (No. 2613)	8,200 gallons
Process Storage Tank (No. 2621)	4,200 gallons
Process Storage Tank (No. 2623)	4,200 gallons
Vent Recovery Tank (No. 2622)	4,200 gallons
No. 2 Stripper Tank	2,000 gallons
VCM Distillation Column	NA

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bc:

Mr. T. D. Epps
Mr. C. E. Fry
Mr. R. T. Kramer .
Mr. W. C. Young
Mr. R. N. Wheeler
Mr. H. L. Wise

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SOUTH CHARLESTON PLANT

UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS

P.O. BOX 8004, SOUTH CHARLESTON, W. VA. 25303

Q.C. TO → M.E. EISENHART/R.L. FRANTZ
→ W.T. GRAY/W.A. MAZZOLINI

RECEIVED

DEC 14 1976

JEE

December 3, 1976

*FOR YOUR INFO - this is what
S. Charleston submitted -*
J...

Mr. Abraham Ferdas
Environmental Protection Agency
Region III Curtis Building 2nd Floor
6th & Walnut Streets
Philadelphia, Pennsylvania 19106

Ref: Memo, J. L. Worstell
to Abraham Ferdas,
November 21, 1976

Dear Mr. Ferdas:

In accordance with the recently promulgated emission standards for vinyl chloride, the attached description of the required leak detection and elimination program (§61.65 (b) (8)) is submitted for approval by the Administrator.

Very truly yours,

J. L. Worstell

J. L. Worstell
Environmental Protection
Coordinator

JLW/pl

Attachment

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060666

NATIONAL EMISSION STANDARD FOR VINYL CHLORIDE

61.65 (b) (8) Leak Detection and Elimination Program

* Union Carbide Corporation
South Charleston, West Virginia

Objectives

1. Prevent leaks by preventive maintenance and good work procedures.
2. Discover and repair accidental leaks, i.e., leaks not controllable by preventive maintenance and good work procedures.
3. Keep adequate records to demonstrate to E.P.A. that Union Carbide Corporation is in compliance with the E.P.A. regulation.

Program

I. Prevent Leaks

1. All major equipment in vinyl chloride service is inspected by trained process safety inspectors on an annual basis. This inspection includes tests for metal loss, weld failure and structural integrity. Hydrostatic strength tests are made at regular intervals even in the absence of faults revealed by inspection.
2. Faulty valves are removed, disassembled, work parts replaced, reassembled and leak tested prior to reinstallation.
3. Relief valves are inspected monthly. Relief valves are removed, cleaned, seats lapped, reset, tested for leaks and reinstalled on an annual basis.

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Program (continued)

I. Prevent Leaks (continued)

4. Relief valves that have relieved are removed, cleaned, seats lapped, reset, tested for leaks and are reinstalled promptly.
5. Rupture discs are inspected regularly and are replaced at two-year intervals.
6. Disassembled pipe and equipment flanges are cleaned, regasketed with new gaskets and reassembled.
7. All pipelines in vinyl chloride service are inspected externally for evidence of corrosion failure on an annual basis, particularly in areas where the pipe is supported by hangers and structure and where flanged joints appear. This thorough inspection by skilled Process Safety Inspectors is in addition to inspections by operating personnel.
8. Installed spare equipment such as pumps and compressors is provided so that leaking or poorly operating items can be removed from service promptly for repair.
9. Material in process inventories are managed so that vessels in vinyl chloride service can be removed from service and emptied promptly if leaks develop.
10. Equipment and pipelines are leak tested with inert gas after disassembly for cleaning and repair.
11. Operating personnel are trained in the hazards of vinyl chloride and in the methods and work procedures to minimize emissions.

Program (continued)

II. Discover and Repair Accidental Leaks

A. Fixed vinyl chloride monitoring systems

Union Carbide Corporation, after a thorough study of available monitoring systems, chose to build its own systems. The purchased systems generally did not meet internally developed selection standards for sensitivity, precision, specificity, cost, maintenance and delivery time.

The monitoring system in use is identified as a Union Carbide Corporation Model 1200 automatic chromatograph. The unit consists of a three-column chromatograph with a flame ionization detector requiring two minutes to analyze an air sample to a sensitivity of 0.05 ppm vinyl chloride. The system analyzes samples taken from 19 points and checks its calibration against a standard sample every forty minutes. Visible and/or audible alarms are automatically actuated when the VCM concentration exceeds 5 ppm in any sample, when the calibration sample analysis fails to check, when sample flow is inadequate and when the unit is over ranged (> 25 ppm). Output data is collected and correlated by a computer and the results printed on an automatic typewriter. Three of these systems are used to monitor work space, leak and vent emission concentration at the South Charleston, West Virginia Plant.

The automatic chromatograph system is routinely checked by the instrument mechanic daily (or more frequently) for

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

A. Fixed vinyl Chloride monitoring system (continued)

proper operation. Faulty parts are replaced promptly. Since the system checks itself each cycle, little or no manual testing is required to provide essentially 100% availability. These systems have been functioning since mid-1974.

The output print from the automatic typewriter showing the individual analysis for each point, time and summary data are filed daily for the record along with appropriate information on point location.

- B. A "leak" defined in terms of the fixed monitor data is a significant departure from the average background vinyl chloride concentration in the plant. The average background concentration is less than 1 ppm and the standard deviation for the average is 2 ppm. Compensating for the skewed distribution curve requires the arbitrary use of a change of over four standard deviations to indicate a significant change, a leak is defined as two consecutive analysis of a single point showing 10 ppm or more vinyl chloride concentration. An analysis of 25 ppm or more requires emergency procedures. Leaks are also indicated by the sound of the emission, frosting at the leak point, visible gas emission and process controls. These other characteristics of a leak are obvious and presumably do not need formal definition.

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

C. Portable Leak Detector

Two Century Organic Vapor Analyzers Model OVA98B are used for locating leak sources when leaks are indicated by the fixed monitor or area studies are made to check the integrity of operating, procedures and equipment. The Century OVA analyzer has a sensitivity of approximately 1 ppm for organic vapors. Specificity, while desirable is not required since once the leak is located the source of the leak gives an indication of leak composition.

The Century OVA operating procedure provides for routine tests of the battery and the indicator span and zero with each use. The Century OVA is tested with a standard air sample containing 100 ppm methane daily. Stable vinyl chloride air samples cannot be prepared and nitrogen vinyl chloride samples upset the instrument detector.

Union Carbide Corporation, South Charleston Plant, utilizes a computerized preventive maintenance program (RM-1) to periodically recall a variety of electronic instruments, used for safety/environmental measurements, into the plant instrument shop for inspection, any necessary adjustments or repairs and calibration. The computerized program provides means for notification when inspections are due and for maintaining individual historical records related to accuracy, reliability, mainte-

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

C. Portable Leak Detector (continued)

nance, etc. Portable hydrocarbon detectors (Century OVA's) used in the plant vinyl chloride leak detection/elimination program are on a three (3) month RM-1 schedule.

In addition to the above program, weekly inspections of Century OVA's used in vinyl chloride leak detection/elimination are conducted by trained instrument mechanics on duty in immediate areas where these instruments are stored and used. Thus, quick service is available in the event of a malfunctioning portable hydrocarbon detector. Weekly inspections include the following check list which is essentially the instrument start up procedure plus calibration. (This same procedure is the standard operating procedure in preparing the instrument for actual use.)

STANDARD OPERATING PROCEDURE - CALIBRATION

1. Check instrument sampling pump by engaging pump switch.
2. Check indicator to assure that the battery is adequately charged.
3. Turn instrument switch on and allow five (5) minute warm-up.
4. Check calibration with "low" and "high" calibration switch.
5. Check sample flow rate indicator (rotometer) to assure sample flow.

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

C. Portable Leak Detector (continued)

6. Check hydrogen tank pressure gauge (0-300 psi) to assure adequate supply.
7. Open hydrogen tank valve and the hydrogen supply valve.
8. Ignite the burner per instrument instructions.
9. Insert the portable hydrocarbon detector sample probe through the valve stem and into a 5 - 10 liter TEDLAR bag containing 100 ppmv methane in air to assure instrument response. (100 ppmv methane in air is prepared in cylinders per the procedure described in a previously submitted equivalency determination application.)

D. Action Program for Accidental Leak Control

1. On indication of a leak or an alarm from the monitoring system, personnel are to put on respirators immediately or are to evacuate the area.
2. The source of the leak or the leak area will be announced over the public address system or the radio telephone system by the foreman or his deputy.
3. The designated operator, protected by a respirator, will proceed immediately to the leak area for an audible-visible survey.
4. If the designated operator can locate the leak source, then he effects repair if possible or requests help from the foreman and takes the pipe-

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

D. Action Program for Accidental Leak Control (continued)

line or equipment item out of service, i.e., prepares it for opening.

5. The foreman, if required, provides assistance via other personnel or summons maintenance personnel and makes repairs.
6. If the leak is not readily found by visible or audible means, the foreman sends the designated Century OVA operator to the area to survey the suspected area.
7. The Century OVA operator locates the leak and notifies the foreman who arranges for its repair.
8. On location and repair of the leak, the foreman or his deputy prepares a leak report noting the time of the leak, its location and its cause. He also describes the action taken to repair the leak and its current status. This report is signed by the foreman and filed daily as required by the regulation.
9. The manufacturing department head for the plant reviews leak reports regularly and takes further action if a leak is repetitive or there is indication of an underlying problem. The department head also acts to ensure the availability of trained Century OVA operators and of trained repair personnel.

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System

The vinyl chloride monitoring system at the South Charleston West Virginia Plant consists of three automatic chromatograph systems (See previous description) with a combined total of sample points of 57. These are used to accomplish three basic objectives.

- (a) Monitor the work space atmosphere as required by the Occupational Safety and Health Standard.
- (b) Leak detection as required by the Environmental Protection Administration Standard for Vinyl Chloride [§61.65 (b) (8)].
- (c) Monitor vinyl chloride control equipment emissions as required by the EPA Vinyl Chloride Standard [§61.68 (a)].

The location of the sample points was selected based upon Industrial Hygiene studies conducted by the plant and upon judgmental probability of emissions occurring at a specific location. Where vinyl chloride is frequently detected, or there is a high probability of VCM detection the sample point concentration is higher than areas where there is a low probability of a leak or an emission. The location of sample points is shown of Figures I and II which encompasses plant areas where vinyl chloride is transferred, stored or used. Figure I shows the unloading and storage

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System (continued)

area. Figure II shows the resin manufacturing area. Shaded areas show the location of equipment in vinyl chloride service.

A listing and description of the sample point locations is as follows:

Chromatograph No. 1

<u>Sample No.</u>	<u>Description</u>
1	Outside south end of polymerization and stripping building (Building 153).
2	Inside south end of polymerization and stripping building (Building 153).
3	Inside south center area of polymerization and stripping building (Building 153).
4	Inside north center area of polymerization and stripping building (Building 153).
5	Outside north west corner of polymerization and stripping building (Building 153).
6	Vent solvent scrubber area east of solvent recovery building (Building 154).
7	Inside north end of polymerization and stripping building (Building 153).
8	South end of polymerizer structure (Building 153).
9	South center area of polymerizer structure (Building 153).

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System (continued)

Chromatograph No. 1 (continued)

<u>Sample No.</u>	<u>Description</u>
10	North center area of polymerizer structure (Building 153).
11	North end of polymerizer structure (Building 153).
12	Vinyl chloride unit storage tanks (south tank area Building 154).
13	Building 191 control room area.
14	Building 154 control room area.
15	Vinyl chloride metering and storage tank area (south tank area Building 154).
16	Dilute solvents storage tank area south of Building 153.
17	Lower level of stripping area, polymerization and stripping building (Building 153).
18	Upper level of stripping area polymerization and stripping building (Building 153).
19	South east corner structure, solvent recovery building (Building 154).
20	Calibration gas sample cylinder.

Chromatograph No. 2

21	Resin slurry area, second level, resin processing building (Building 152).
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Program (continued)

II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System (continued)

Chromatograph No. 2 (continued)

<u>Sample No.</u>	<u>Description</u>
22	Supervisors offices, second level, resin processing building (Building 152).
23	Resin precipitation area, second level, resin processing building (Building 152).
24	Process control room, third level, resin processing building (Building 152).
25	Resin precipitation area, third level, resin processing building (Building 152).
26	Resin slurry area, third level, resin processing building (Building 152).
27	Resin testing laboratory area, third level, resin processing building (Building 152).
28	Resin solution storage area, tanks south of polymerization and stripping building (Building 153).
29	Process control room, fourth level, resin processing building (Building 152).
30	Resin wet grinder area, fourth level, resin processing building (Building 152).
31	Stack sample vent incineration system (Building 151).

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System (continued)

Chromatograph No. 2 (continued)

<u>Sample No.</u>	<u>Description</u>
32	North resin grinding area, fourth level, resin processing building (Building 152).
33	Center resin grinding area, fourth level, resin processing building (Building 152).
34	Gel processing area, fourth level, resin processing building (Building 152).
35	Clarifier area, fifth level, resin processing building (Building 152).
36	No. 1 primary centrifugal area, fifth level, resin processing building (Building 152).
37	No. 1 secondary centrifugal area, fifth level, resin processing building (Building 152).
38	Batch precipitator area, fifth level, resin processing building (Building 152).
39	Batch precipitator area, fifth level, resin processing building (Building 152).
40	Calibration gas sample cylinder.

Chromatograph No. 3

1N	North fence of bulk storage area at west end of tank car unloading station.
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Program (continued)

II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System (continued)

Chromatograph No. 3 (continued)

<u>Sample No.</u>	<u>Description</u>
2N	South end of tank car unloading station in bulk storage area.
3N	North fence of bulk storage area at center of tank car unloading station.
4N	Middle of tank car unloading station, bulk storage area.
5N	North fence at east end of tank car unload- ing station.
6N	Pipe rack at south east end of tank car unloading station, bulk storage area.
7N	Pipe rack at north west corner of tank No. 9030, bulk storage area.
8N	Pipe rack at north east corner of tank No. 9020, bulk storage area.
9N	Pipe rack at south east corner of tank No. 9020, bulk storage area.
10N	Pipe rack at south east corner of tank No. 9014, bulk storage area.
11N	Pipe rack at south west corner of tank No. 9016 (VCM tank), bulk storage area.
12N	Pipe rack at north west corner of tank No. 9016 (VCM tank), bulk storage area.

Program (continued)

II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System (continued)

Chromatograph No. 3 (continued)

<u>Sample No.</u>	<u>Description</u>
13N	Pipe rack at north east corner of tank No. 9016 (VCM tank), bulk storage area.
14N	Pipe rack at south east corner of tank No. 9016 (VCM tank), bulk storage area.
15N	Pipe rack west of tank No. 9016 (VCM tank) refrigeration unit, bulk storage area.
16N	Pipe rack east of tank No. 9016 (VCM tank) refrigeration unit, bulk storage area.
17N	North side of tank No. 9016 (VCM tank) refrigeration unit, bulk storage area.
18N	Underside of tank No. 9016 (VCM tank), bulk storage area.
19N	Western portion of bulk storage area near tank No. 9997.
20N	Calibration sample gas cylinder.

NOTE: The foregoing layout and description of sample points was in effect December 1, 1976. Union Carbide Corporation will relocate these points for greater effectiveness as monitoring results indicate a need.

Program (continued)

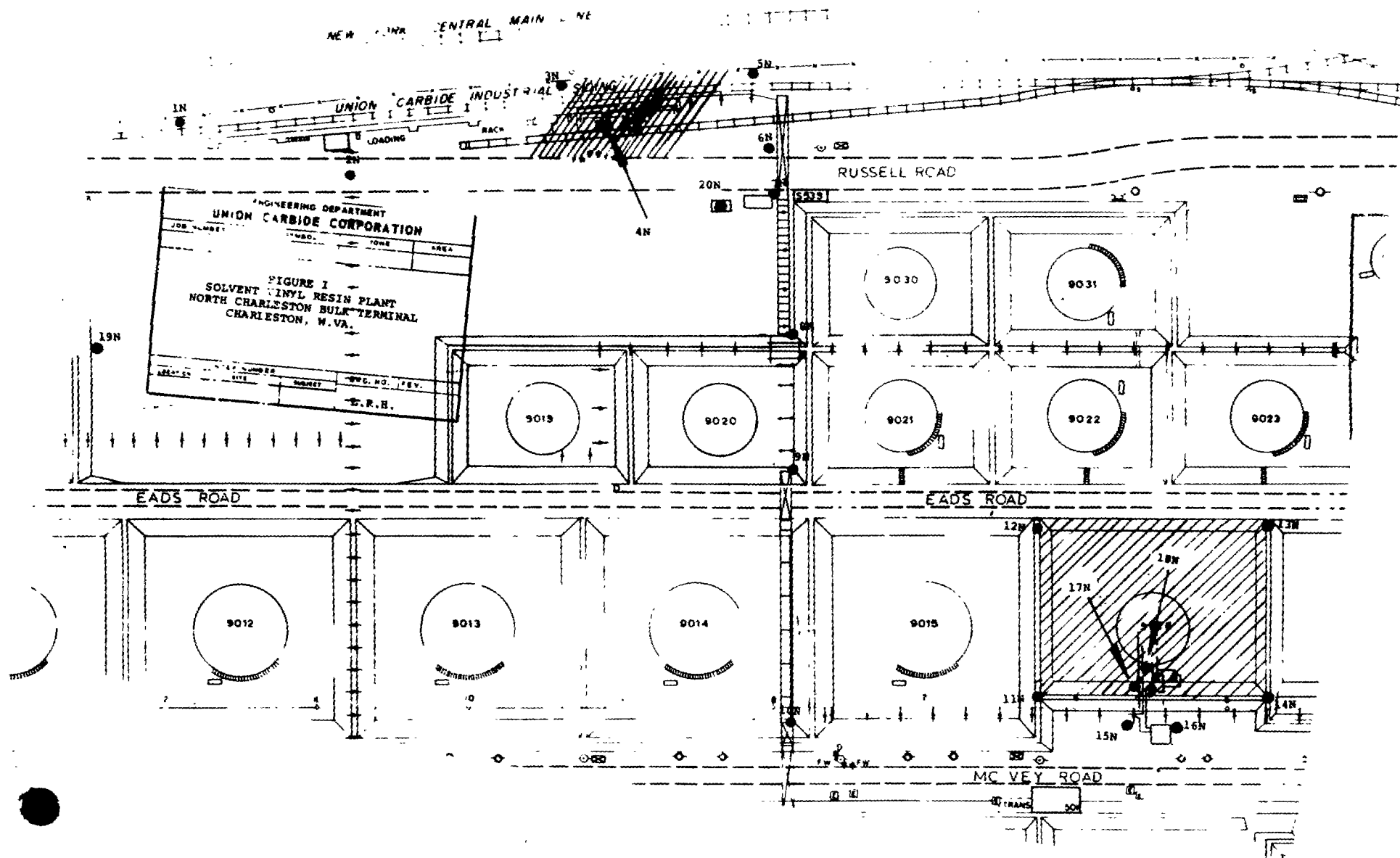
II. Discover and Repair Accidental Leaks (continued)

E. Layout of Leak Monitoring System (continued)

Major Plant Equipment in Vinyl Chloride Service \$61.65 (2)

<u>Item</u>	<u>Volumetric Capacity</u>
Railway Tank Cars	25 to 48,000 gallons
Tank Car Unloading Structure	NA
Storage Sphere (No. 9016)	430,000 gallons
No. 1 Polymerizer	10,000 gallons
No. 2 Polymerizer	10,000 gallons
No. 5 Polymerizer	10,000 gallons
No. 6 Polymerizer	10,000 gallons
Process Storage Tank (No. 2611)	8,200 gallons
Process Storage Tank (No. 2613)	8,200 gallons
Process Storage Tank (No. 2621)	4,200 gallons
Process Storage Tank (No. 2623)	4,200 gallons
Vent Recovery Tank (No. 2622)	4,200 gallons
No. 2 Stripper Tank	2,000 gallons
VCM Distillation Column	NA

UCC
060683



bc:

Mr. T. D. Epps
Mr. C. E. Fry
Mr. R. T. Kramer
Mr. W. C. Young
Mr. R. N. Wheeler
Mr. H. L. Wise

UCC
060685

BARCEL - 12/14/76

please make 2
sets of this report &
send 1 to Eisenhower/
Frost

and 1 to Gray/Magellan

By Thurs is OK

GIVE ME
BACK THE
ORIG. PLEASE

UCC
060686

J. T. Bouchier _____
D. E. Deese _____
J. F. Erdmann _____
N. A. Gimber _____
F. L. Keller _____
T. L. Rapp _____

File _____

UCC
060687

Telephone Conversation - Vinyl Chloride
Abe Ferdas (EPA Region III) to
J. L. Worstell, 5/13/77

XC / Jack Endicott
Bill Brubaker
PEG
WTC
WAM

RECEIVED

MAY 23 1977

J. F. E.

- 1) Good news. Ferdas ~~recently~~ returned from Washington, D.C. with decisions on equivalencies for 514.

- 2) Abe says that everything "looks good". We will get the equivalencies, with some "qualifications". No details on the "qualifications", because Abe wants to review the info before forwarding it on to us.

I hope that his definition of "looks good" is the same as ours!

- 3) Should get the info in about a week.

- 4) Apparently Abe is going to simplify some of the "qualifications", e.g., he felt that some of the requests for additional data for the Method 106 equivalency were not really needed, and he was probably going to delete some of the requirements for extra data (!!!).

- 5) I explained that the equivalency for a standard check gas for the chromatographic monitoring systems was more important than appeared at first glance. Strict adherence to the EPA method for standard check gas would create a very awkward problem for us. Abe pointed out that several changes had been made in this regard, and perhaps these changes would solve our problem.

- 6) It appears that we should "sit tight" regarding the four equivalency issues. In a week or so we may find that we are in good shape, and perhaps many, if not most, of our concerns will fall by the wayside.

- 7) Leak Detection and Elimination: Abe said he would review and approve this in about 6 months when he comes to 514 for a field inspection. He commented that he could see no problems; ours were among the best that he had seen.

J. L. Worstell
5/16/77

RECEIVED
MAY 20 1977

W. T. GRAY, Jr.

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