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10-84

VELSICOL CHEMICAL COMPANY
ST. LOUIS, MICHIGAN
MECHANICAL INTEGRITY TESTING REPORT
WASTE DISPOSAL WELL NO. 2

PREPARED BY:
WESLEY W. SMITH
OCTOBER, 1984

Golden StrataServices, Inc.

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1.0 INTRODUCTION

All Class I waste disposal wells in the State of Michigan must demonstrate mechanical integrity as required by the United States Environmental Protection Agency (US EPA) under the Underground Injection Control (UIC) Program, Section 146.08(a.1 & 2). The mechanical integrity tests (MIT) are designed to demonstrate that (1) "there is no significant leak in the casing, tubing or packer" and (2) "there is no significant fluid movement through vertical channels adjacent to the injection wellbore".

The test procedures were verbally approved by the Michigan Department of Natural Resources (MDNR) prior to performing the tests. The test procedures included two major events as follows.

* The 5 1/2" x 7" annulus was tested to 505 psi for 30 minutes.
* A radioactive tracer survey (RAT) was run on the well.

2.0 SUMMARY OF RESULTS

The MIT on Velsicol's disposal well No. 2 was performed and witnessed by Howard C. Novakowski and Charlie Brown representing the EPA, Region V, and Tyrone V. Black with the MDNR. Also present were Don Robinson with Conestoga Rover & Associates (CR & A) and Wesley W. Smith with Golden StrataServices, Inc. (GSS).

The annulus was tested to 505 psi with a total of 12 psi pressure drop, or 2.3% bleed off, during the prescribed test period of 30 minutes. However, the annulus was filled with 7± barrels of brine prior to a pressure build-up. It is believed this was caused by the operator using 10 - 11 lb/gal. brine in the well during the last workover. A void area (trapped air) would have been left in the annulus if it was not filled up with fluid after setting the packer. The tight fitting 5 1/2" casing collars run inside the 7" O.D. casing could have trapped fluid at the surface.

The RAT survey successfully depicted the path of the radioactive slugs carried by the injected brine fluid inside the tubing, in the open hole section and as it disappeared into the disposal zone. Also, the leak free condition of the tubing and casing strings were further proven to be sound by injecting a second slug from the gamma ray tool and running the gamma ray tool down 100' through the radioactive slug to a depth of 3400'. The tool was held stationary at 3400' and recorded passage of the radioactive slug only once. After a period of seven minutes no increase in radioactivity was detected. This procedure indicated that there was no upward migration of injected fluid adjacent to the wellbore.

3.0 OPERATIONS SUMMARY

10-8-84 Traveled from Houston, Texas to Detroit, Michigan by airline and then drove to Velsicol's temporary office site at St. Louis, Michigan. Met with Don Robinson with CR & A and Richard Martin with Efficiency Equipment Company. Drove to the waste disposal well No. 2 site and reviewed the basic equipment required to conduct the MIT. Prior arrangements were made to bring in a 500 barrel frac tank filled with 10,000 gallons of oilfield brine. Contacted Gearhart Industries, Inc. to be on location at 8:00 am October 9, 1984 with wireline and mast units . Shutdown for night.

10-9-84 Drove to the wellsite and met the following personnel: Howard C. Novakowski and Charlie Brown representing the EPA in the State of Michigan; Tyrone V. Black and James R. Heinzenan with the MDNR; Don Robinson with CR & A; Richard Martin with Efficiency Equipment Company and Steven P. Noffke with Gearhart Industries, Inc. A crane was used to remove the protective building covering the wellhead. Wellhead equipment and an appropriate pump could not be obtained within a reasonable time during daylight hours and the MIT was postponed until October 10, 1984. Shutdown for night.

10-10-84 The same regulatory personnel were again on site as on October 9, with the exception of James Heinzman. Moved in and rigged up Gearhart's wireline unit, Long & Wetzel's portable pump truck,

and a crane. (The crane was used in place of Gearhart's mast unit). Installed pipe fittings on wellhead for the wireline lubricator, control valves and pressure gauge on the annulus outlets. Hooked up the pump truck to the casing and slowly pumped 10.2 lb/gal. brine into the annulus area at the rate of 10 - 20 gallons per minute. After pumping in approximately 7± barrels of brine, the pressure increased slowly to 505 psi as observed on the calibrated pressure gauge (see Appendix B.1 & B.2). After successfully testing annulus, the pump hose was transferred to the tubing inlet and brine was pumped into well. Pressure was left on casing. Initial shut-in tubing pressure was 200 psi. The tubing pressure dropped from 200 psi to zero while pumping brine at a rate of 1 1/2 - 1 barrels per minute. While pumping brine into well, the RAT survey was started. A Gamma Ray tool was run to a maximum depth of 3437' (TD 3716'). Pulled tool out of the hole and ran sinker bars on wireline in an attempt to break through a potential bridge in the open hole. Wireline operator was unable to get below 3716' and pulled tools out of the hole. Reran the Gamma Ray tool and ran (1) the first base log, (2) RAT survey which graphically depicted a radioactive slug moving down the tubing into the open hole section and exiting into the disposal zone and (3) a second radioative slug injected from the logging tool at a depth of 3300' and the tool moved to 3400' and held stationary. The tool recorded passing the radioactive slug when moving downward to a

depth of 3400'. The tool was left in place at 3400' for seven minutes to record the radioactive slug passage and potential upward movement of injected fluid behind the 7" long string casing. No indication of channeling was evident in this well as shown by the RAT survey. A second base log was run. (This information is illustrated in the MIT test data and in the RAT log attached in Appendix B.1 & B.3). Pulled tool out of hole. Rigged down Gearhart wireline unit and moved off location. Continued pumping the remainder of the brine from the frac tank into the well and when completed, rigged down pump truck and moved off. Picked up and reset portable building over wellhead. Removed special fitting and valves and returned x-tree to its previous hook up. Removed all other equipment from wellsite.

10-11-84 Returned to Houston. MECHANICAL INTEGRITY FIELD WORK COMPLETED.

4.0 CONCLUSIONS

All field work associated with the first mechanical integrity tests on Velsicol's disposal well No. 2 at St. Louis, Michigan were completed successfully and this well is considered to be mechanically sound and suitable for use as a Class I injection well.

APPENDIX A

DRAFT

WELL INTEGRITY PRESSURE TESTING AND MONITORING

Pressure testing is one of the standard industry procedures utilized to demonstrate there is no significant leak in the casing, tubing or packer of an injection well. The only equipment necessary to conduct a pressure test is a device to generate fluid pressure, provided that the well to be tested is equipped with suitable well head pressure gauges. If the well to be tested is not equipped with a suitable wellhead, the well must first be outfitted with that equipment. The wellhead should have pressure gauge connections so that the pressure applied to the casing or casing-tubing annulus, and the injection tubing pressure, can be monitored during the test period.

Procedures

The procedures for pressure testing an injection well differ depending on whether the well to be tested is a new well or an existing well, and further differ in existing wells depending on the construction details of the well. The methods for testing the following injection well configurations are described below:

1. Existing and Conversion wells with tubing and packer
2. New Wells
3. Existing wells without tubing and packer
4. Existing wells with tubing, but without packer
5. Existing wells with short tubing and packer
6. Monitoring Casing - Tubing Pressures

1. Existing and Conversion wells with tubing and packer

These are wells which inject through tubing with the packer set not more than 75 feet above the injection zone. The operator should fill the annulus with a non-corrosive fluid at least two hours prior to the Field Inspector's arrival. Then perform Tests (A) and (B)*. If the Field Inspector certifies the well has mechanical integrity, the "Mechanical Integrity Tests" form will serve as approval to operate a permitted well.

*Tests refer to those on the "Mechanical Integrity Tests" form.

2. New Wells

Following the completion of a new injection well, the well casing can be test before drilling out the casing shoe or the casing is perforated. The operator should fill the casing with a non-corrosive fluid at least two hours prior to running test (C). This tests can be run by the operator without the presence of the EPA Field Inspector, provided he runs the test in accordance with the specified procedure and records the data on the "Mechanical Integrity Tests" form. After a successful test (C), the operator can complete the well and install the tubing and packer according to the permit requirements. The operator should fill the annulus with a non-corrosive fluid at least two hours prior to the Field Inspector's arrival. Then perform Test (A). If the well passes both tests and the Field Inspector certifies the well has mechanical integrity, the "Mechanical Integrity Tests" form will serve as approval to operate a permitted well.

3. Existing wells without tubing and packer

A well without tubing and packer requires the installation of a temporary packer or retrievable bridge plug not more than 75 feet above the injection zone. The operator should fill the casing with a non-corrosive fluid at least two hours prior to the Field Inspector's arrival. Then perform test (C).

4. Existing wells with tubing, but without packer

A well with tubing, but without packer, requires the removal of the tubing and the installation of a temporary packer or retrievable bridge plug not more than 75 feet above the injection zone. The operator should fill the casing with a non-corrosive fluid at least two hours prior to the Field Inspector's arrival. Then perform test (C). The tubing can be visually inspected.

5. Existing wells with short tubing and packer

To test these wells, the operator may run tubing and set the packer not more than 75 feet above the injection zone, and then test in the same manner as existing and conversion wells with tubing and packer (procedure #1). As an alternative, these wells can be tested in the same manner as existing wells with tubing, but without packer (procedure #4).

6. Monitoring Casing - Tubing Pressure

Operator's with wells completed with tubing and packer set not more than 75 feet above the injection zone may opt to monitor the casing-tubing annulus pressure monthly and report the information in their annual report, in lieu of repeating the pressure tests every five years. This may be done following initial pressure tests (A) and (B) or (C).

DRAFT

FORM OR PERMIT # _____
DATE OF PERMIT _____

MECHANICAL INTEGRITY TESTS

COMPANY NAME VELSICOL CHEMICAL CORPORATION

ADDRESS 341 W WASHINGTON ST.

CITY AND STATE ST. LOUIS MI. 48880

LEASE NAME DURAND WELL NO. 2

LEGAL DESCRIPTION ___ 1/4 ___ 1/4 SE 1/4 OF SECTION 15

TOWNSHIP 8N RANGE 2-E

Class I

SALT WATER DISPOSAL WELL X ENHANCED RECOVERY WELL _____

MAXIMUM PRESSURE AUTHORIZED 150 psi INJECTION INTERVAL 3414-3716 ft

NEW WELL _____ CONVERSION _____ EXISTING ✓ PACKER DEPTH ___ ft

DATE OF LAST INSPECTION 1980

I. No significant fluid movement into a USDW through channnels adjacent to well bore:

Demonstration Adequate: (YES/NO) Date: 10-10-84
Method Used: (CHECK ONE OR MORE) Reviewer: [signature]

___ Cementing Records
___✓ Tracer Survey (in conjunction with another method)
___ Temperature Log
___ Noise Log
___ Other Acceptable Method (Specify)

II. No significant leak in casing, tubing or packer:

METHOD(S) USED:

(A) TUBING-PACKER PRESSURE TESTS

PROCEDURE: (1) Fill annulus with fluid and allow at least 2 hours for temperatures to stabalize (2) while injecting at maximum or average injection pressure, observe and record injection and annulus pressure, or fluid flow.

TEST WITNESSED BY: _____ (COMPANY REPRESENTATIVE) _____ (EPA FIELD INSPECTOR)

DATE: _____
DATA RECORDED BY: _____
TIME SINCE: INJECTION BEGAN _____ (hrs/days) ANNULUS FILLED _____ (hrs/days)

ACTUAL INJECTION PRESSURE _____ psi
CASING-TUBING ANNULUS PRESSURE _____ psi
WATER FLOWED FROM ANNULUS (YES/NO)
FLOW: ESTIMATED VOLUME _____ Gals; TIME FOR FLOW TO STOP _____ Mins

RESULTS: (PASS/FAIL) - If fail, shut down and reschedule test after appropriate repairs have been completed.

(B) CASING-TUBING ANNULUS PRESSURE TEST

PROCEDURE: (1) Top off annulus with fluid, if more than 100 gallons are required, allow at least 2 hours for temperatures to stabilize, (2) pressure annulus to maximum injection pressure authorized or 500 psi, whichever is greater, (3) observe and record injection tubing pressure and annulus pressure simultaneously for at least 30 minutes. (Note: This test may be run while well is shut-in or injecting. If injecting, must maintain a minimum of 100 psi difference between injection and annulus pressures.)

TEST WITNESSED BY: [signature] (COMPANY REPRESENTATIVE) [signature] (EPA FIELD INSPECTOR)

DATE: 10/10/84
DATA RECORDED BY: [signature] (655)
WELL: (INJECTING/SHUT-IN): HOW LONG SINCE SHUT-IN 48 (hrs/days)

INJECTION: PRESSURE ____ psi; RATE 4114-2063 (BBls/D) (During injection or just prior to shut-in)

TUBING PRESSURE	ANNULUS PRESSURE	TIME
100	500	at 0 MINUTES
100	495	at 5 "
100	497	at 10 "
100	496	at 20 "
100	493	at 30 "

RESULTS: (PASS/FAIL) - If results are not obvious, repeat above test. If annulus pressure fails to hold, Shut down and reschedule test after appropriate repairs have been completed.

(C) CASING PRESSURE TEST

PROCEDURE: (1) With the well head and bottom of casing sealed, fill casing with fluid and allow several hours for temperatures to stabilize (2) Pressure casing to maximum injection pressure authorized or 200 psi, whichever is greater. (3) observe and record pressure for 30 minutes.

TEST WITNESSED BY: _____ _____
(COMPANY REPRESENTATIVE) (EPA FIELD INSPECTOR)

DATE: _____
DATA RECORDED BY: _____
INITIAL PRESSURE: _____ psi PRESSURE AFTER 30 MINUTES _____ psi

RESULTS: (PASS/FAIL) - If fail, shut down and reschedule test after appropriate repairs have been completed.

(D) MONTHLY CASING-TUBING MONITORING

PROCEDURE: (1) After initial pressure tests (A) and (B) or (C) maintain a positive pressure of 5 to 10 psi and monitor annulus pressure monthly.

Annual Report Data:

YEAR	INJECTION PRESSURE RANGE	ANNULUS PRESSURE RANGE	REMEDIAL ACTIONS TAKEN	REVIEWED BY	DATE

III. REMARKS _____

IV. From the knowledge obtained from the above tests, it is my opinon that this well has mechanical integrity: (YES/NO)

_____ _____ _____
(COMPANY REPRESENTATIVE) (EPA FIELD INSPECTOR) (DATE)

APPENDIX B

Mechanical Integrity Field Test Data
Velsicol Chemical Corporation
St. Louis, Michigan
Disposal Well No. 2

Annulus Pressure Test

Time	Casing* Pressure (psi)	Remarks
8:55 am	0	Filling annulus slowly.
9:20 am	0	Pumped in 7± barrels 10.2 lb/gal. brine.
9:21 am	0	Shutdown to refill tank truck.
9:32 am	154	Annulus filled up bled off air.
9:38 am	250	Shut down to check pressure.
9:43 am	250	Resumed pumping slowly.
9:53 am	505	Shut down pump, disconnected pump line. Start test.
9:58 am	500	
10:04 am	499	
10:14 am	495	
10:24 am	493	Annulus test stopped

Results: Pressure drop 12 psi in 31 minutes, or 2.3% leak off.

*Pressured measured by 3D Instruments, Inc. 0 - 1500 psi gauge (Serial #8306527N) calibrated on October 4, 1984 with dead weight tester No. 1NA.35688 (see attached certificate, Appendix B).

Golden StrataServices, Inc.

Mechanical Integrity Field Test Data
Velsicol Chemical Corporation
St. Louis, Michigan
Disposal Well No. 2

Radioactive Tracer Survey

1. First base log: 3437' to 3100'

2. First Radioactive Slug Ejection:

Pass No.	Time (pm) From	To	Depth, ft. From	To	Slug Depth (ft)	Remarks
	2:59:00		3300'			Released radioactive slug
1	3:00:00	3:00:30	60'	3345'	3355'	Pump rate 1.5 bpm
2	3:01:00	3:01:30	90'	3375'	84'	Pump rate 1.5 bpm
3	3:02:00	3:02:30	3430'	3405'	3415'	Pump rate 1.5 bpm
4	3:02:45	3:03:00	3430'	3405'	3417'	Pump rate 1.5 bpm
5	3:03:30	3:04:00	3430'	3405'	3421'	Pump rate 1.5 bpm
6	3:04:15	3:04:30	3430'	3405'	3422'	Pump rate 1.5 bpm
7	3:04:45	3:05:00	3430'	3400'	3423'	Pump rate 1.5 bpm
8	3:05:15	3:05:30	3430'	3400'	Disappeared	Pump rate 1.5 bpm
9	3:06:00	3:06:30	3430'	3400'	Disappeared	Pump rate 1.5 bpm

3. Second Radioactive Slug Ejection:

Time (pm)	Tool Depth (ft)	Remarks
3:23:00	3300'	Released radioactive slug (10 seconds) and moved to 3400' (past radioactive slug).
3:24:30	3400'	Tool stationary at 3400'.
3:25:30	3400'	Radioactive peak.
3:30:30	3400'	Survey stopped - radioactive slug disappeared into disposal zone.

4. Second base log: 3437' to 3100'.

Certificate of Calibration

TEXAS MICRO MET

TRACEABLE TO NATIONAL BUREAU OF STANDARDS

(Dallas - Ft. Worth Area)

☐ Post Office Box 83
204G Bedford-Euless Rd.
Hurst, Texas 76053
(817) 282-2051

(Houston Area)

☒ 5920 North Belt
Suite 102
Humble, Texas 77338
(713) 540-1107

OUR ORDER NO. 8419 DATE 10-4-84

CUSTOMER'S P. O. NO. MMT 10-484

CUSTOMER: GOLDEN STRATA SERVICES

1000 LOUISIANA STE. 2000 HOUSTON, TEXAS 77002

TYPE AND SIZE OF GAUGE 3D 0-1500 PSI PRESSURE GAUGE S/N 8306527K

NATIONAL BUREAU OF STANDARDS NO. 167720 & 174192

LABORATORY STANDARD	FIRST READING	FINAL READING
0	0	0
50	50	50
100	100	100
200	200	200
350	350	350
450	450	450
550	550	550
750	750	750
950	950	950
1050	1050	1050
1250	1250	1250
1400	1400	1400
1500	1500	1500

Tested ON ASHCROFT DEAD WEIGHT TESTER SERIAL NO. 1NA-35688

APPROVED BY R. Lehmann
Q. C. MANAGER

TO BE RE-CALIBRATED

DATE 10-4-85

TMM — 101 (5/83)

GEARHART

RADIOACTIVE TRACER LOG

FILING NO.

COMPANY VELSICOL CHEMICAL CORPORATION

WELL DISPOSAL NO. 2

FIELD ---

COUNTY GRATIOT STATE MICHIGAN

LOCATION

SE

SEC 15 TWP 12N RGE 2W

OTHER SERVICES

NONE

PERMANENT DATUM GL ELEV 718

LOG MEASURED FROM GL 0 FT ABOVE PERM DATUM

DRILLING MEASURED FROM KB

ELEV KB 731

DF -

GL 718

Date	10-10-84		
Run No.	One		
Type Log	RA/Tracer		
Depth-Driller	3716		
Depth-Logger	3437		
Bottom logged interval	3437		
Top logged interval	3100		
Type fluid in hole	Water, Salt Gel		
Max rec temp., deg. F	-		
Operating rig time	Mast Pole		
Recorded by	Noffke		
Witnessed by	Mr. Smith		

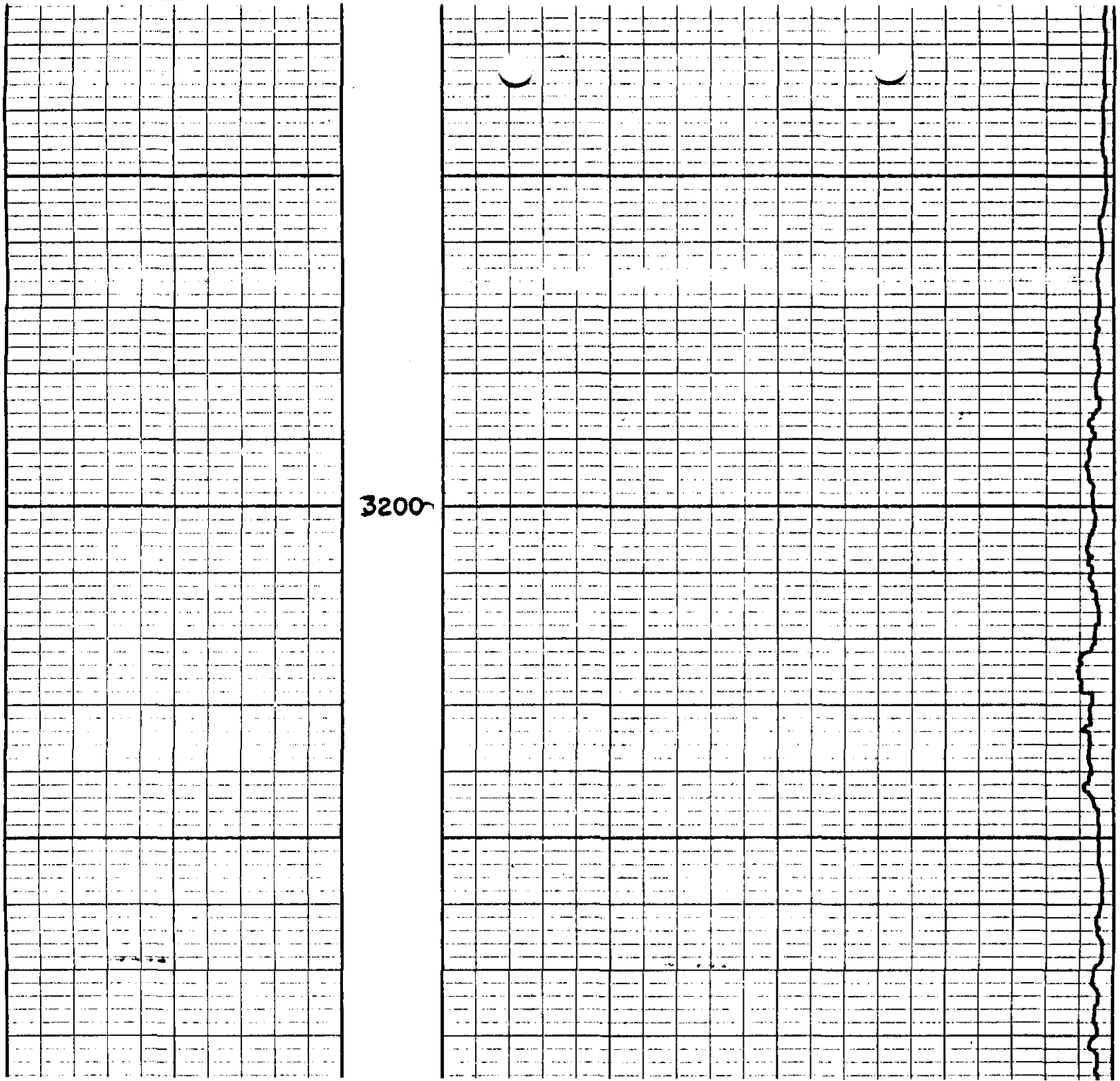
Bore-Hole Record				Tubing Record			
Run No.	Bit	From	To	Size	Wgt.	From	To

Casing Record				Liner			
Size	Wgt.	From	To	Size	Wgt	From	To
10 3/4	32	Surface	713				
7	23	Surface	3414				
5 1/2	17	Surface	3366				

FORM V-110-H R-9/82

3100

FIRST TRACER " BASE " LOG
SHOWING NATURAL RADIATION
W/NO TRACER MATERIAL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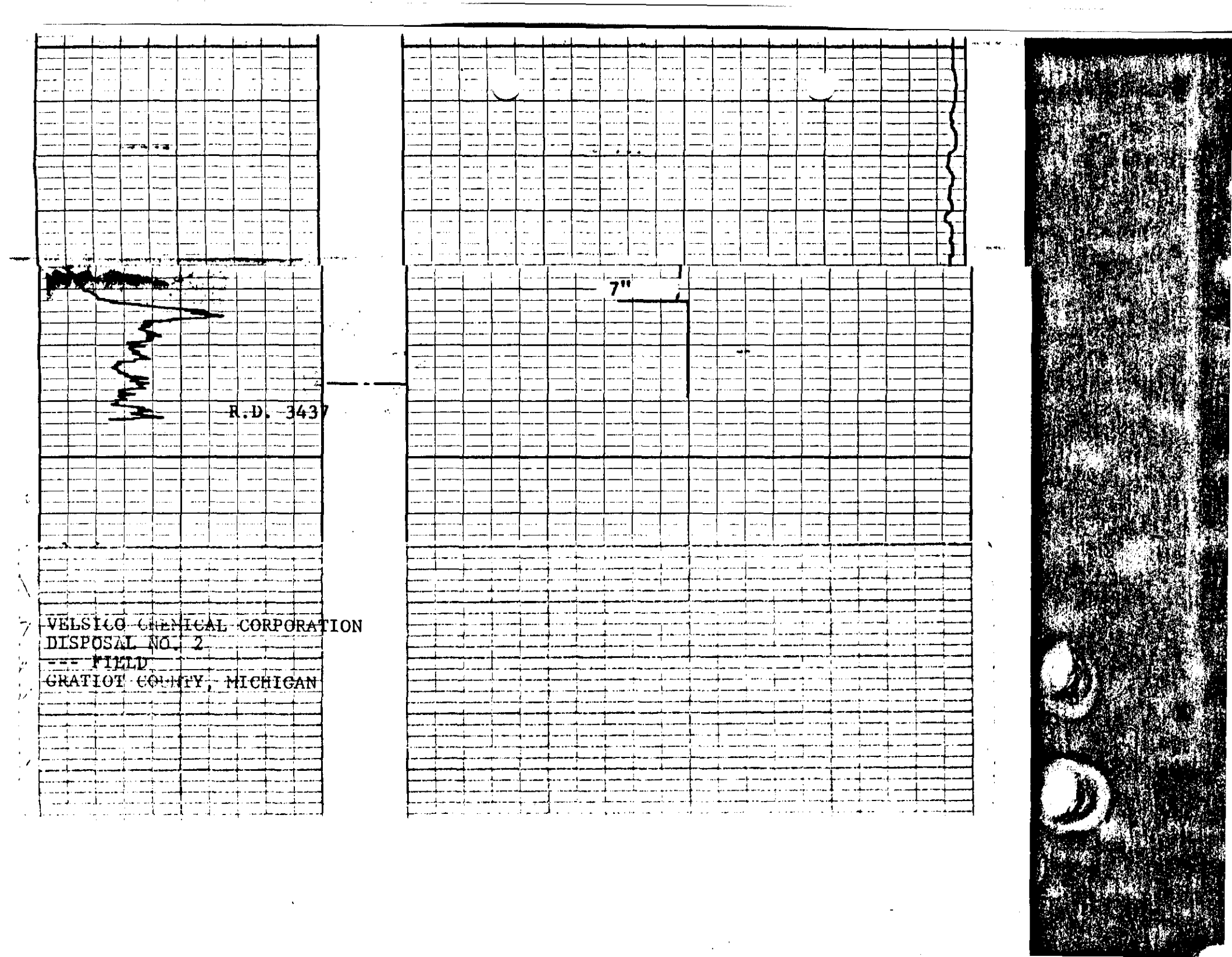
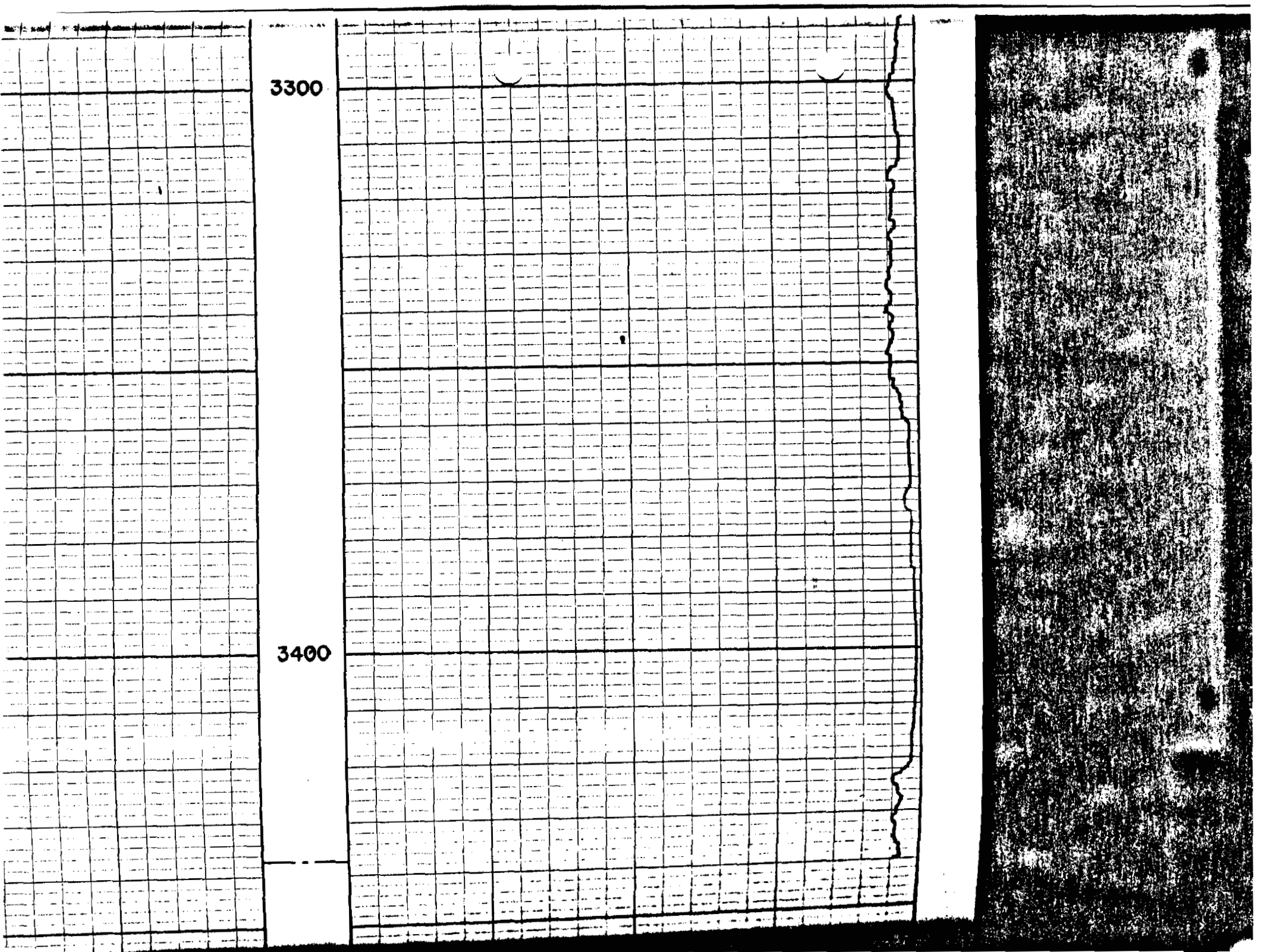

7"
R.D. 3437
VELSICO CHEMICAL CORPORATION
DISPOSAL NO. 2
--- FIELD
GRATIOT COUNTY, MICHIGAN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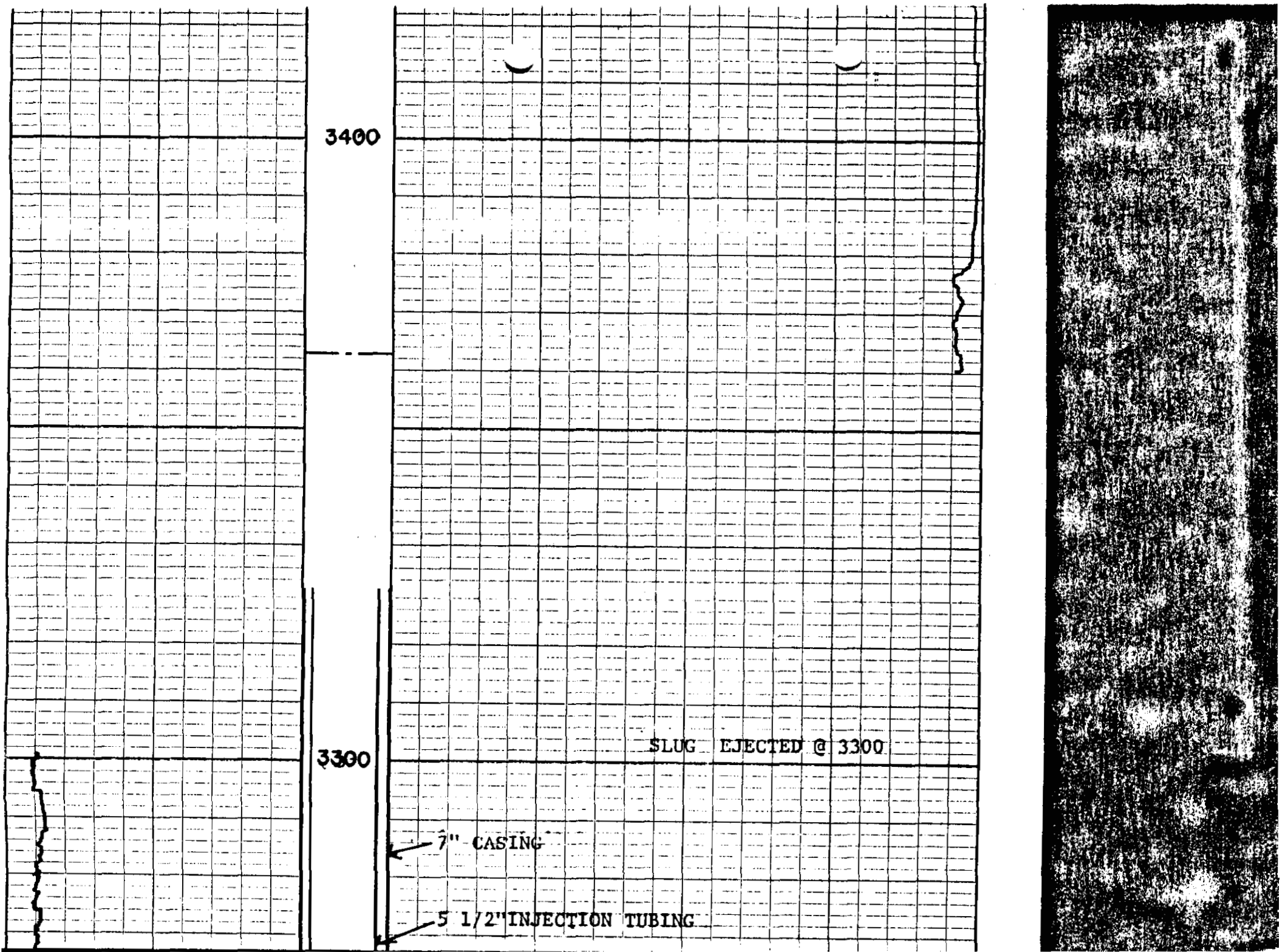
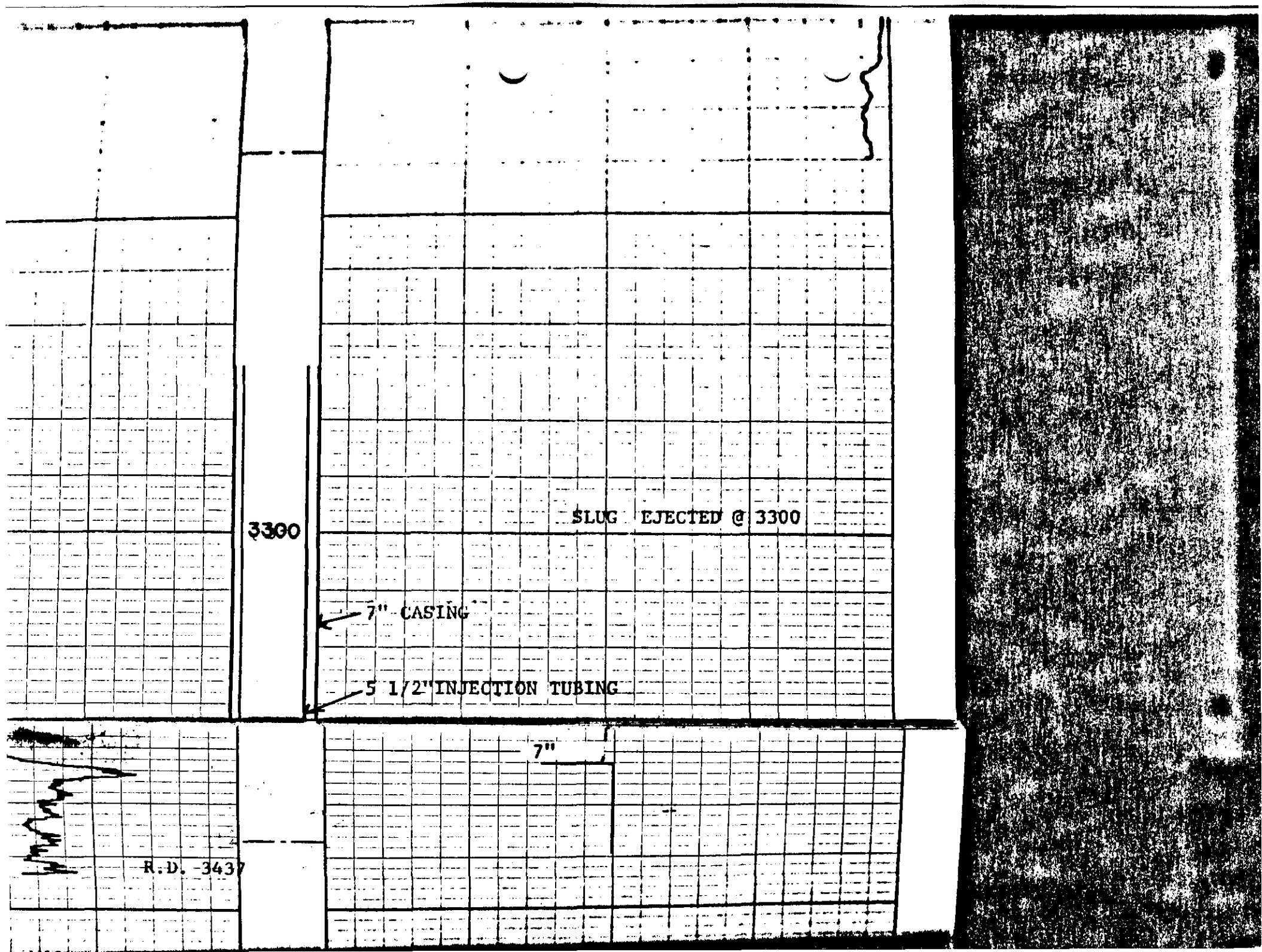
3400


3400
3300
SLUG EJECTED @ 3300
7" CASING
5 1/2" INJECTION TUBING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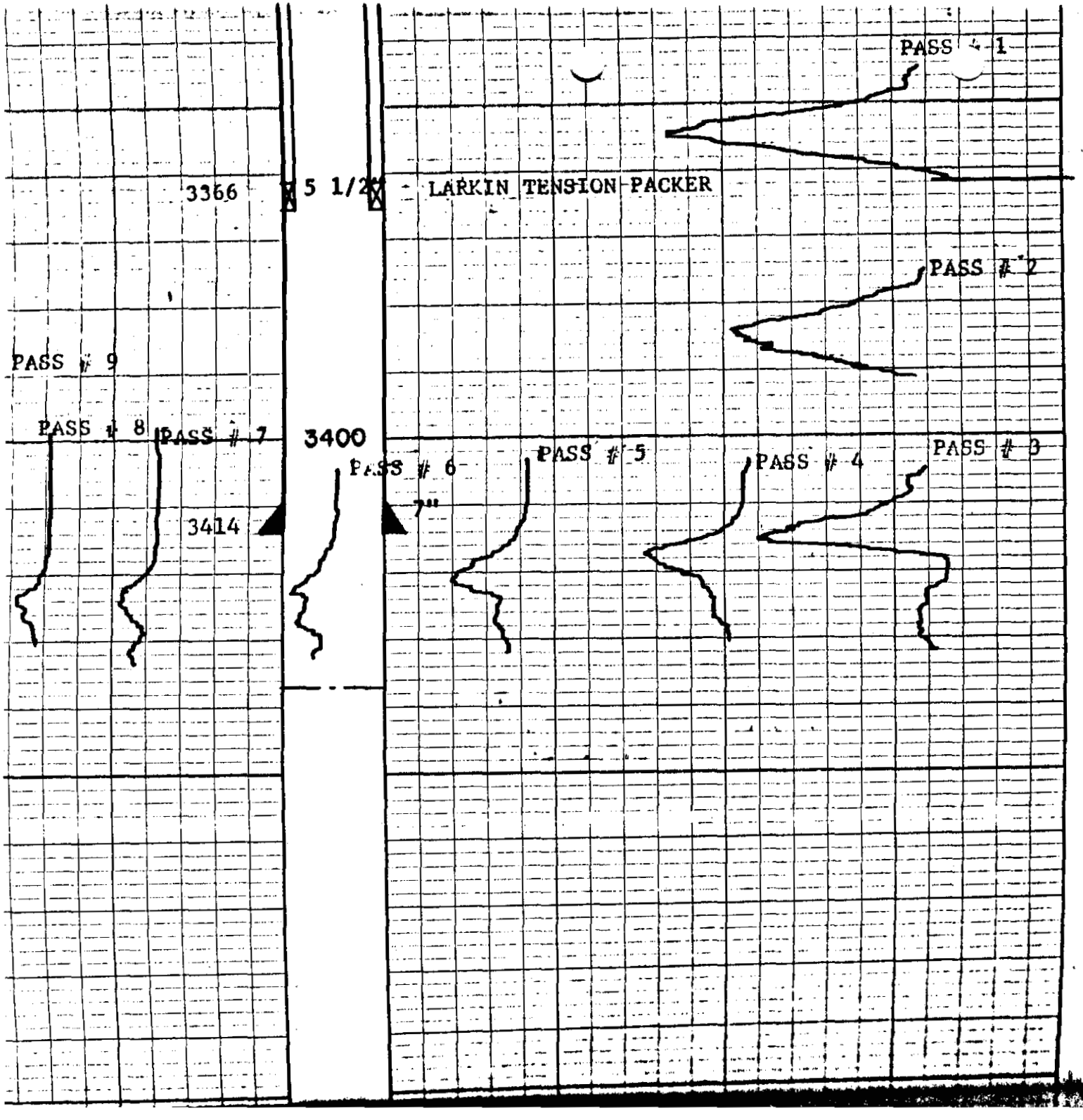
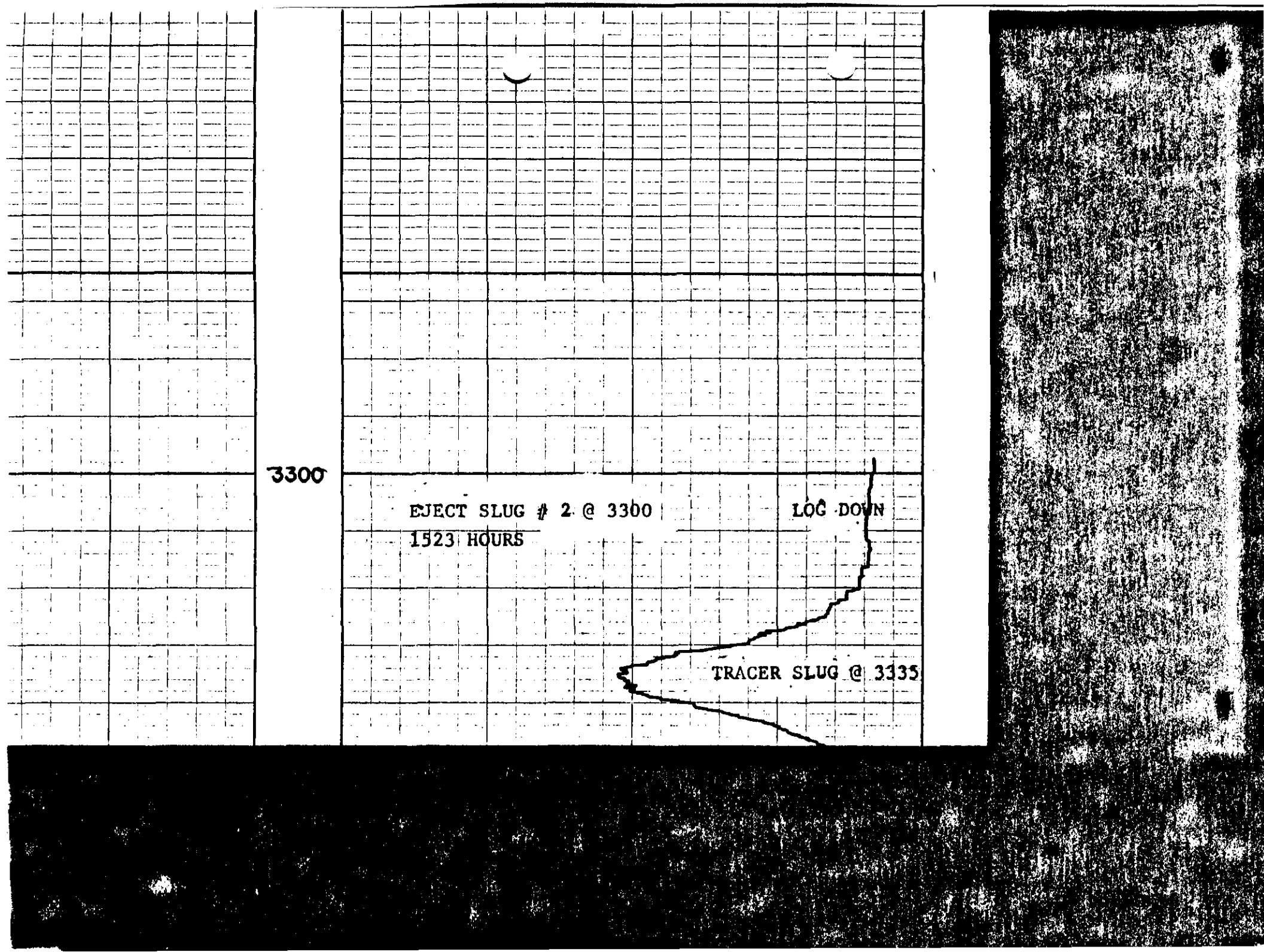
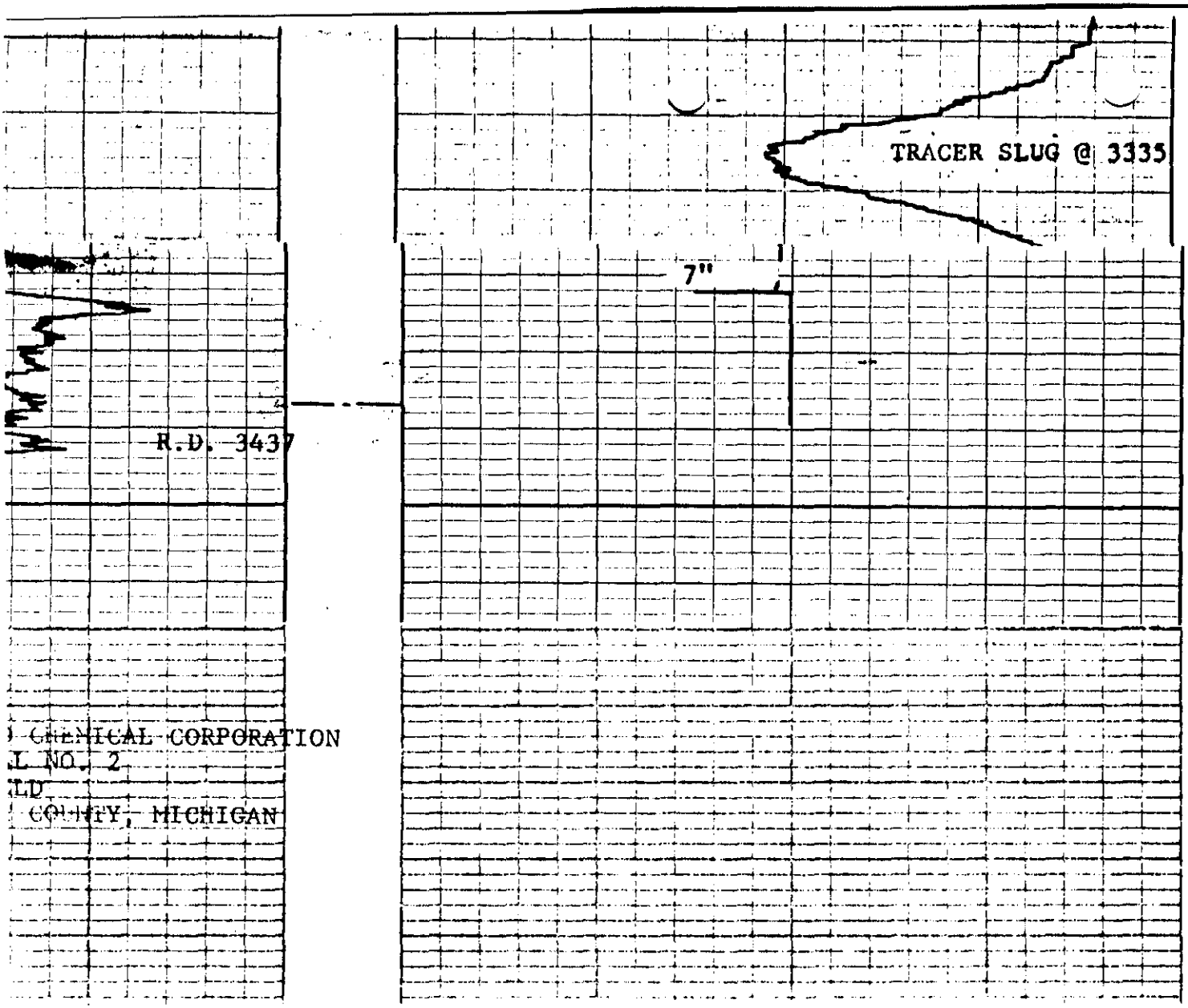
SLUG EJECTED @ 3300
7" CASING
5 1/2" INJECTION TUBING
7"
R.D. -3437


PASS # 1
3366
5 1/2"
LARKIN TENSION PACKER
PASS # 2
PASS # 9
PASS # 8
PASS # 7
3400
PASS # 6
PASS # 5
PASS # 4
PASS # 3
7"
3414

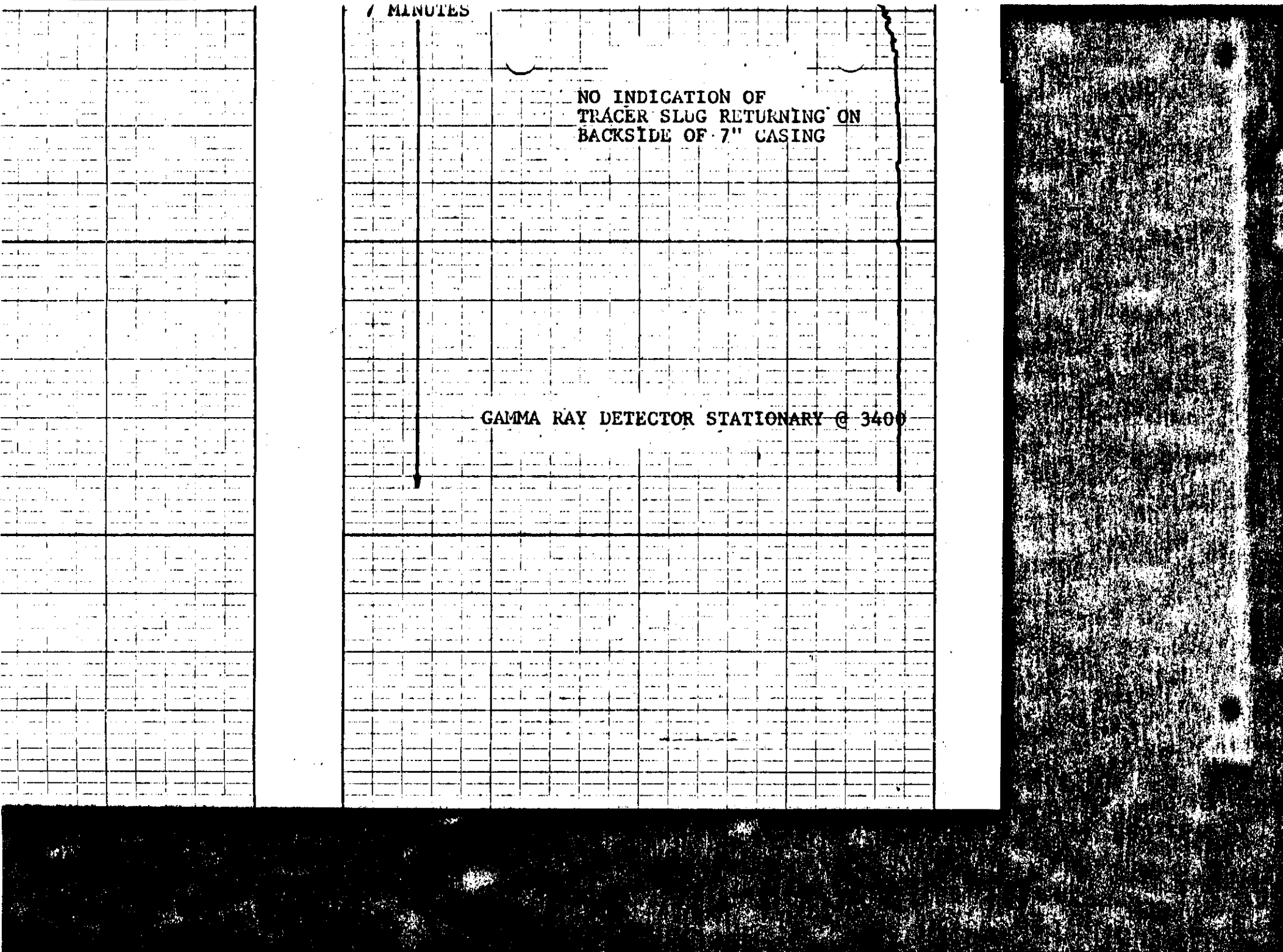

3300
EJECT SLUG # 2 @ 3300
1523 HOURS
LOG DOWN
TRACER SLUG @ 3335

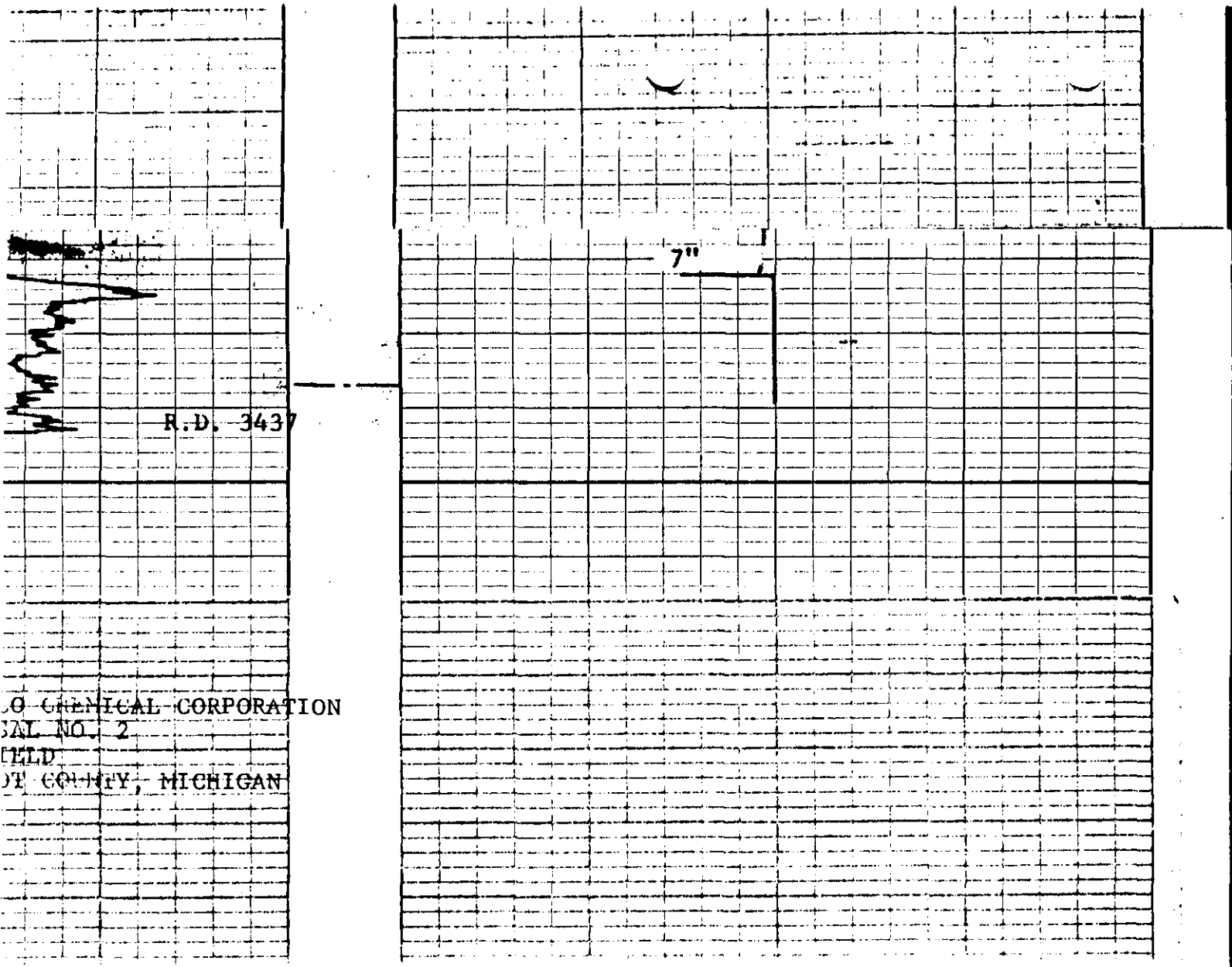

TRACER SLUG @ 3335
7"
R.D. 3437
CHEMICAL CORPORATION
L NO. 2
LD
COUNTY, MICHIGAN

7 MINUTES

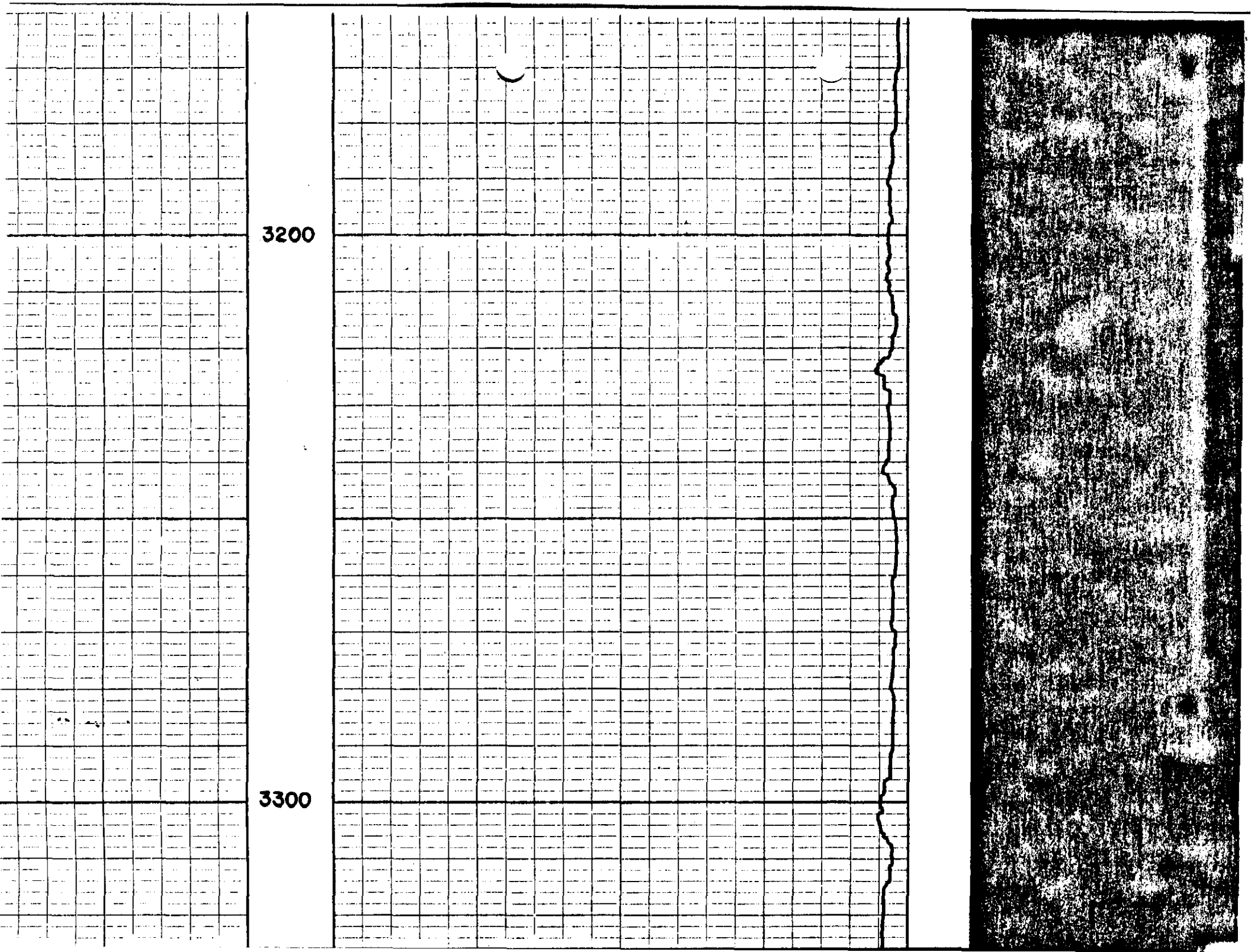
NO INDICATION OF
TRACER SLUG RETURNING ON
BACKSIDE OF 7" CASING

GAMMA RAY DETECTOR STATIONARY @ 3400





O CHEMICAL CORPORATION
SAL NO. 2
ELD
OT COUNTY, MICHIGAN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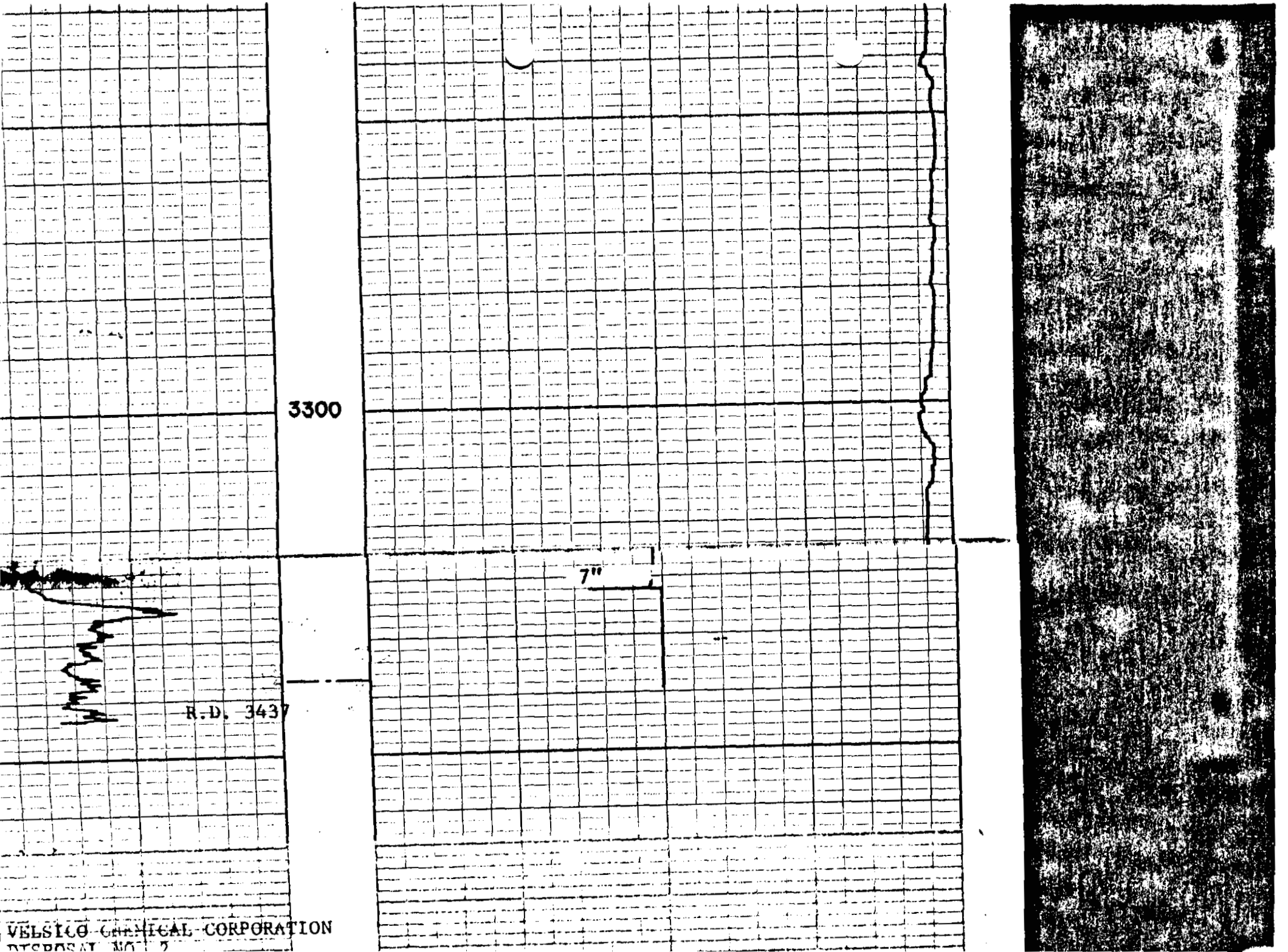
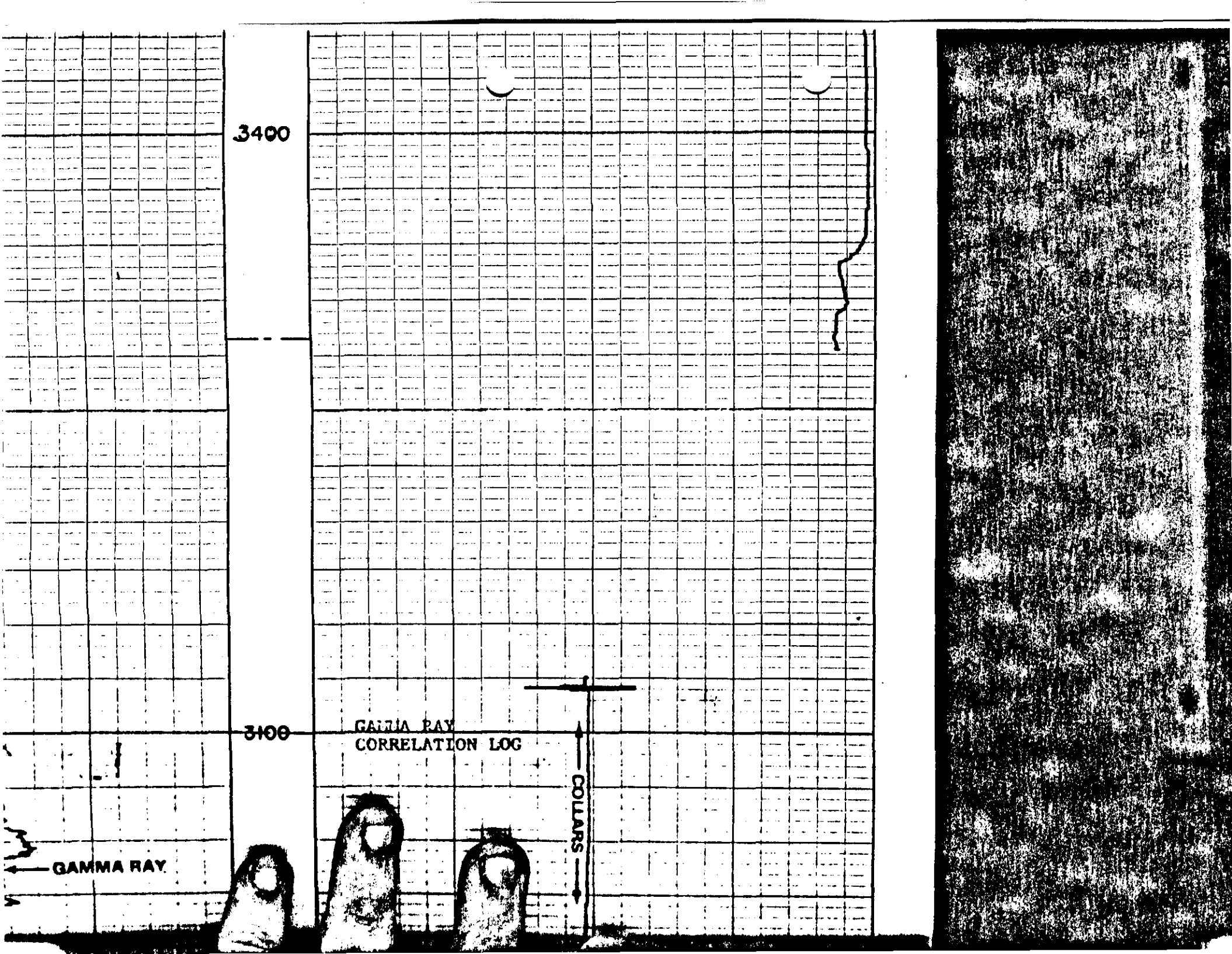
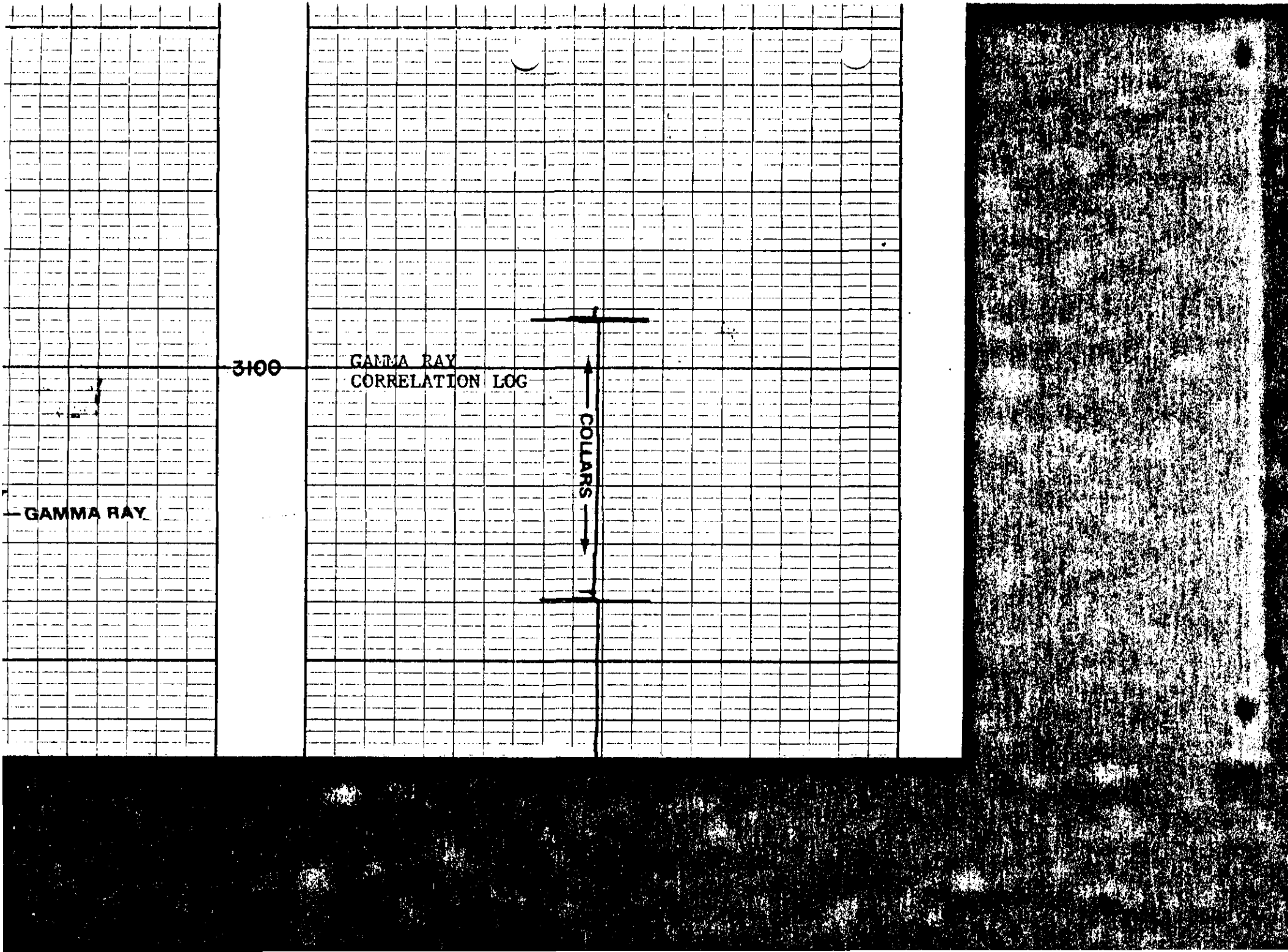


VELSICO CHEMICAL CORPORATION
DISPOSAL NO. 2


3400
3100
GAMMA RAY
CORRELATION LOG
COLLARS
GAMMA RAY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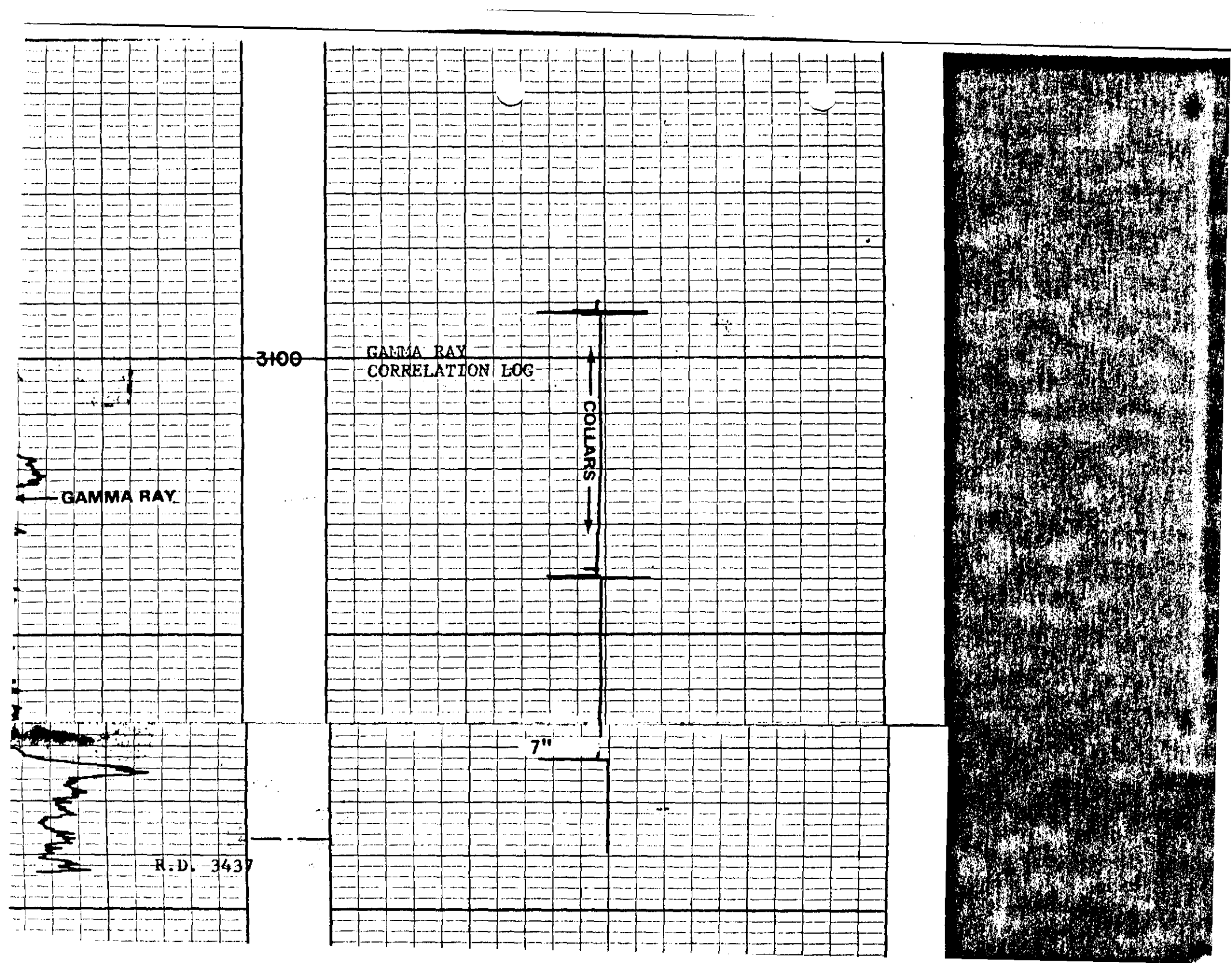
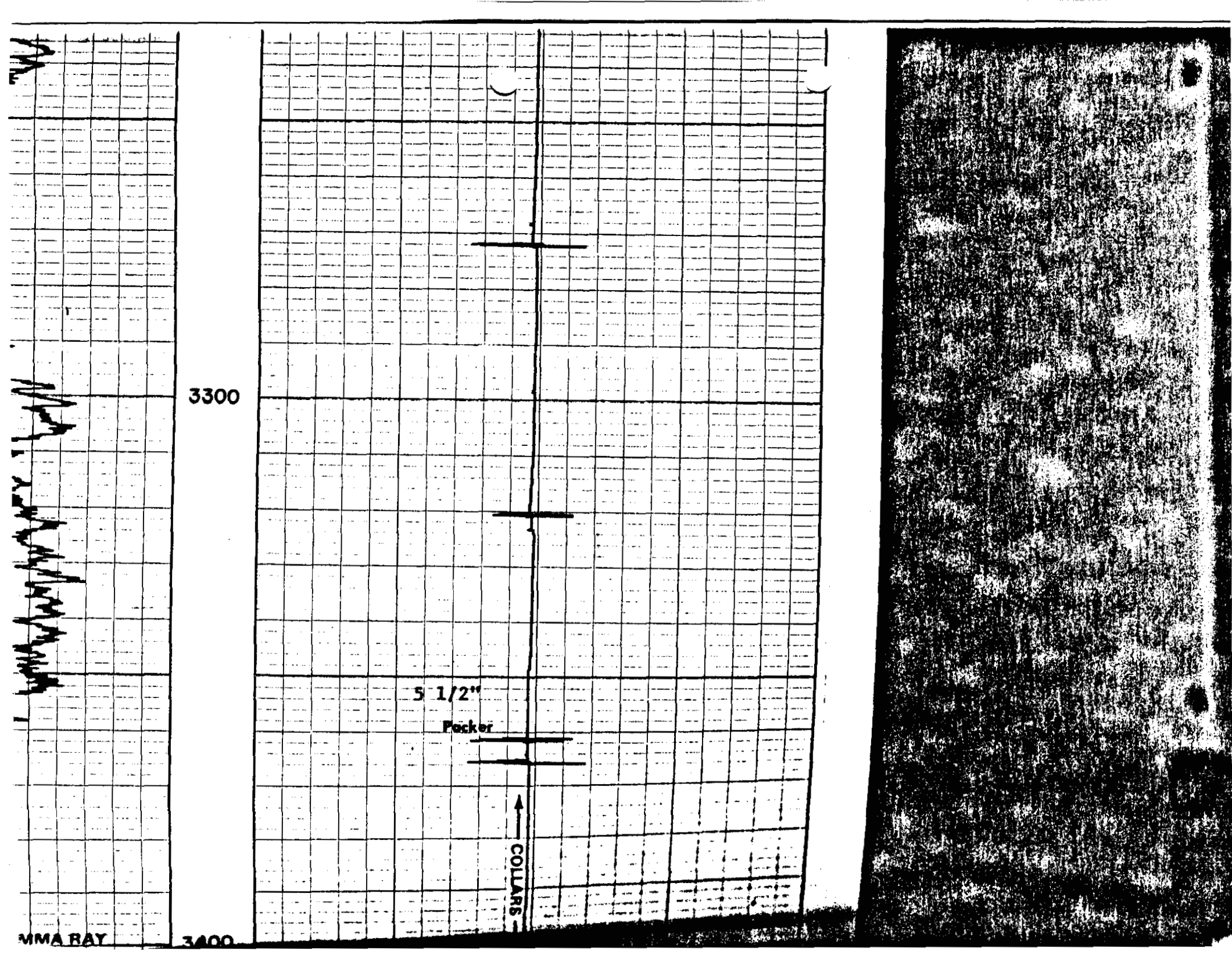
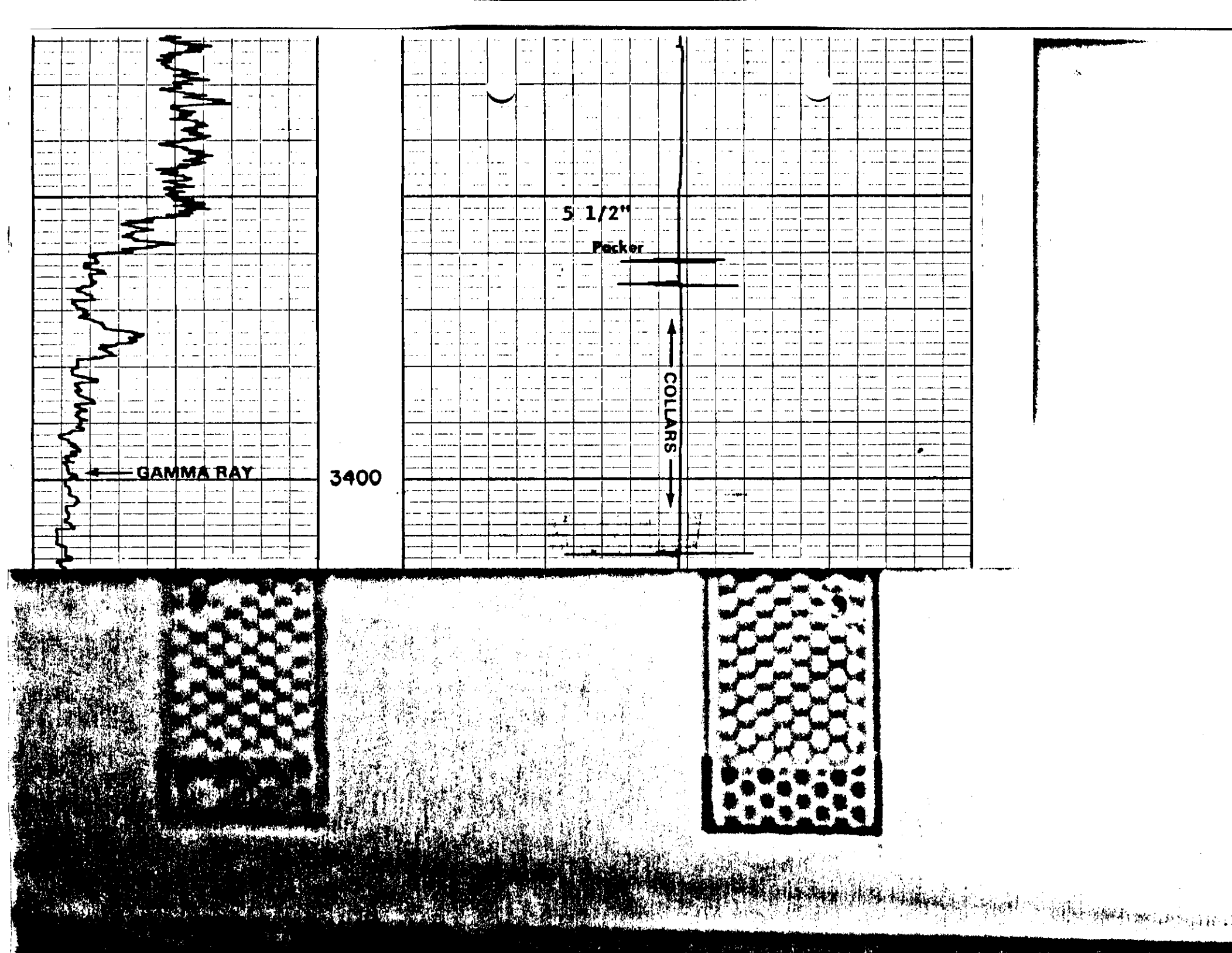
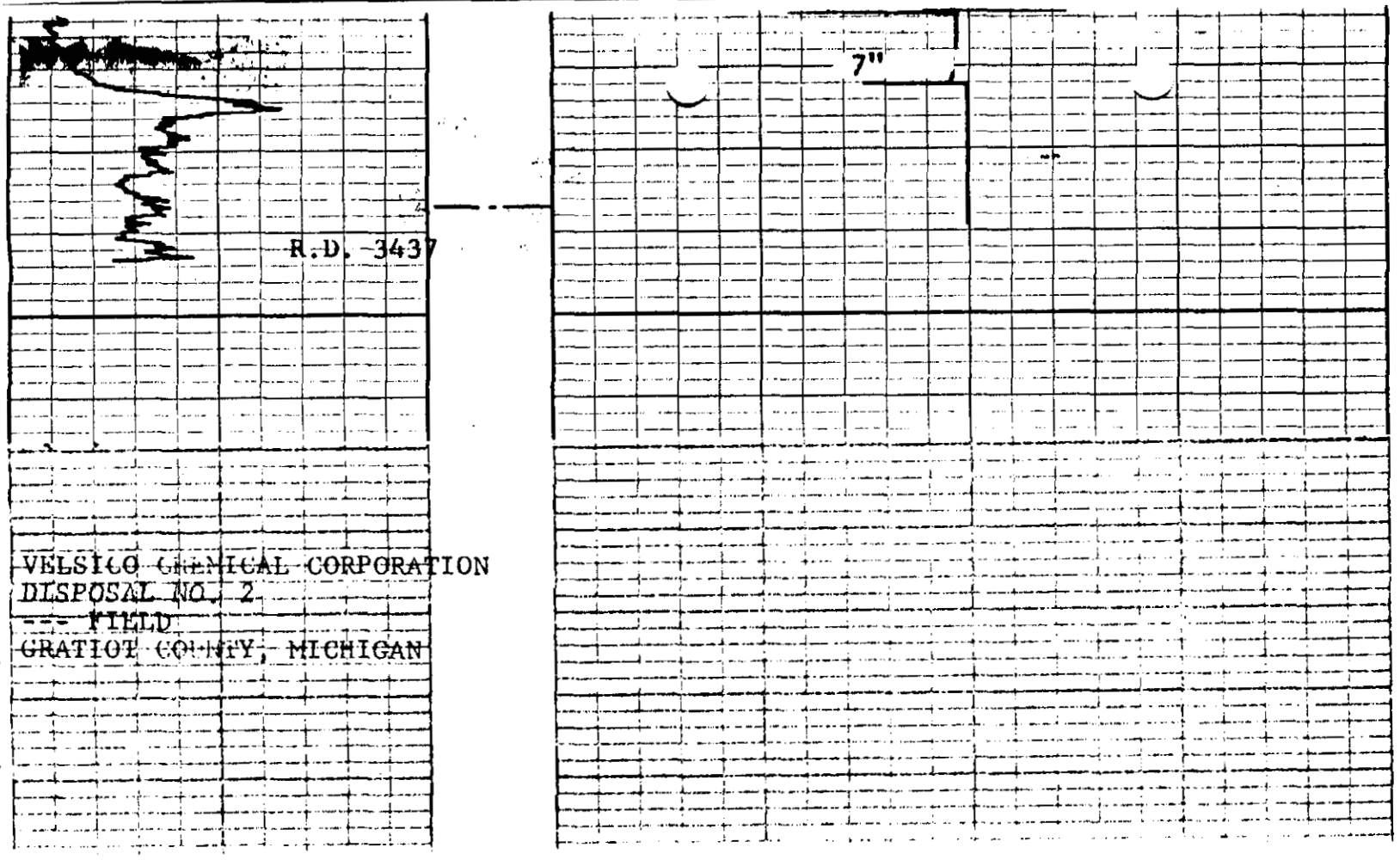
GAMMA RAY
CORRELATION LOG
COLLARS
GAMMA RAY


3100
GAMMA RAY
CORRELATION LOG
COLLARS
GAMMA RAY
7"
R.D. 3437


3300
5 1/2"
Packer
COLLARS
MMA BAY
3400


5 1/2"
Packer
COLLARS
GAMMA RAY
3400


7"
R.D. 3437
VELSICOL CHEMICAL CORPORATION
DISPOSAL NO. 2
--- FIELD
GRATIOT COUNTY, MICHIGAN

FEDERAL EXPRESS

CANSICA INC. LICENSEE

IN BOND

O YYZ

D ORD

ENTRY/ACQUITAL NO.

PORT OF DEPARTURE: Toronto

AIRPORT OF DESTINATION:

COMPANY ENTREPRISE: U.S. Environmental Protection Agency

CONSIGNEE ACCOUNT NO.

CARRIER CODE: 400 AIR WAYBILL NO.: 75643455

(CONSIGNEE/RECIPIENT) DESTINATAIRE: R. Strimbu

CONSIGNEE PHONE NO. (AREA) 312 886-6781

STREET ADDRESS ADRESSE RUE: 230 S. Dearborn Street

CITY VILLE: Chic[illegible] PROV./STATE PROV./ETAT: Illinois COUNTRY: U.S.A. POSTAL CODE / CODE POSTAL: 60604

REPORTING CARRIER

COMPANY ENTREPRISE: CONSTOGA ROVERS & ASSOCIATES LTD.

SHIPPER ACCOUNT NO.: 0142-2070-4

DISPOSITION

☒ DELIVER ☐ HOLD FOR PICK-UP TEL NO.

IF SHIPMENT IS REFUSED BY CONSIGNEE OR CONSIDERED UNDELIVERABLE

BY CARRIER: ☐ RETURN ☐ DISPOSE ☐ ABANDON

FROM (SHIPPER'S NAME) EXPEDITEUR: Don Robinson

SHIPPER PHONE NO (AREA) 519 884-0510

STREET ADDRESS ADRESSE RUE: 651 COLBY DRIVE

CITY VILLE: WATERLOO PROV./STATE PROV./ETAT: ONTARIO COUNTRY: CANADA POSTAL CODE / CODE POSTAL: N2V 1C2

X CONSIGNEE SIGNATURE SIGNATURE DATE/TIME DATE/HEURE

NO OF PKGS: 1

COMMERCIAL INVOICE FOR CUSTOMS

Business Papers

WEIGHT: ☒ LB ☐ KG

SPECIFY CURRENCY _____ VALUE FOR CARRIAGE 1.00 VALUE FOR CUSTOMS 1.00

PLACE AND DATE OF DIRECT SHIPMENT: Waterloo Ontario November 19/84

IMPORTER NAME (IF OTHER THAN CONSIGNEE)

VENDOR NAME (IF OTHER THAN SHIPPER)

COUNTRY OF ORIGIN: Canada

COUNTRY OF EXPORT: Canada

TOTAL CHARGES BLOCK

PREPAID USD	PREPAID CDN	COLLECT USD	COLLECT CDN
	FREIGHT		
	VALUATION		
	ADVANCE ORIGIN		
	DUTY		
	TAX		
	OTHER CHARGES		
	TOTAL		
	CURRENCY CONVERSION RATE		
	TOTAL CHARGES DUE		

SERVICES—CHECK ONLY ONE BOX

1 ☐ PRIORITY ONE OVERNIGHT PACKAGE

2 ☒ COURIER PAK OVERNIGHT ENVELOPE

THESE SERVICES NOT AVAILABLE TO CANADA

3 ☐ COURIER PAK OVERNIGHT BOX 6 ☐ OVERNIGHT LETTER

4 ☐ OVERNIGHT TUBE 7 ☐

5 ☐ STANDARD AIR 8 ☐

9 ☐

☐ SATURDAY SERVICE REQUIRED (Extra Charge Applies)

PAYMENT

☒ BILL SHIPPER ☐ PAYMENT IN ADVANCE

☐ BILL CONSIGNEE FEC. ACCT # _____

☐ BILL 3RD PARTY FEC. ACCT # _____

CREDIT CARD VISA AMEX MC #

THE SHIPPER AGREES TO THE TERMS AND CONDITIONS OF CONTRACT AS SET FORTH ON THE REVERSE SIDE OF THE SHIPPER COPY OF THIS NON-NEGOTIABLE AIR WAYBILL AND VERIFIES THAT INFORMATION CONTAINED ON THIS AIR WAYBILL TO BE TRUE AND CORRECT. THE WARSAW CONVENTION MAY ALSO BE APPLICABLE TO THE CARRIAGE OF THESE GOODS.

1337

X _____ Signature _____ Date

RECEIVED BY F.E.C. NO. I.F.S. NO. DATE/TIME

CUSTOMS ENTRY

TARIFF ITEM	VALUE FOR DUTY		
RATE OF DUTY	S/E TAX STATUS	S.T. RATE	E.T. RATE
DUTY			
SALES TAX			
EXCISE TAX			
TOTAL			

I, _____ (PLEASE PRINT NAME)

OF _____ IMPORTER/AGENT

DECLARE THE PARTICULARS OF THIS ENTRY TO BE TRUE AND CORRECT.

_____ SIGNATURE

DATE P.A. NO ACCT. SEC NO

C APPROVED 54/2/83 **U.S. CUSTOMS COPY**

75643455

CRA
Consulting Engineers

CONESTOGA-ROVERS & ASSOCIATES LIMITED
651 Colby Drive,
Waterloo, Ontario, Canada N2V 1C2
(519) 884-0510

November 14, 1984

Reference No. 1337

COPY

Mr. Thomas W. Shaffer
Manager of Environmental Engineering
Velsicol Chemical Corporation
Memphis Environmental Center
2603 Corporate Avenue
Suite 100
Memphis, Tennessee
38132

Dear Tom:

Re: Disposal Well No. 2 - St. Louis, Michigan

We are enclosing for your files two copies of the report entitled, "Mechanical Integrity Testing Report, Waste Disposal Well No. 2", authored by Golden Strata Services, Inc. The report was prepared following the annulus pressure test and the radioactive tracer log as required by the amended U.I.C. regulations. Please note that both tests were completed successfully and were witnessed by representatives of USEPA and MDNR.

Should you have any questions or comments, please call us at your convenience.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES LIMITED

Don Robinson
Resident Engineer

DR/db
Encl.

cc: Mr. A. Rarick - MDNR
Ms. A. Couture - MDNR
Mr. M. Strimbu - USEPA

RECEIVED
NOV 20 1984
Remedial Response
Section I

CONESTOGA-ROVERS & ASSOCIATES

GEARHART THE GO COMPANY

GEARHART INDUSTRIES, INC.

October 12, 1984

Golden Strata Services, Inc.
1000 Louisiana, Suite 2000
Houston, TX 77002
Attn: Mr. Wesley W. Smith

On October 10, 1984 (1:00 p.m. to 4:00 p.m.) a Radioactive Tracer Survey (RAT) was run on Vescial Chemical Corporation's Disposal Well No. 2 located in the S.E. quarter of section 15, Township 12 North, Range 2 West, Gratiot County, Michigan. Gearhart's Truck Number 6043 was used on the well and the log was run by Steven P. Noffke.

This survey indicated all injected fluid was entering the open hole interval from 3414' to 3437' and that no fluid was able to migrate upward behind the seven inch casing set at 3414'.

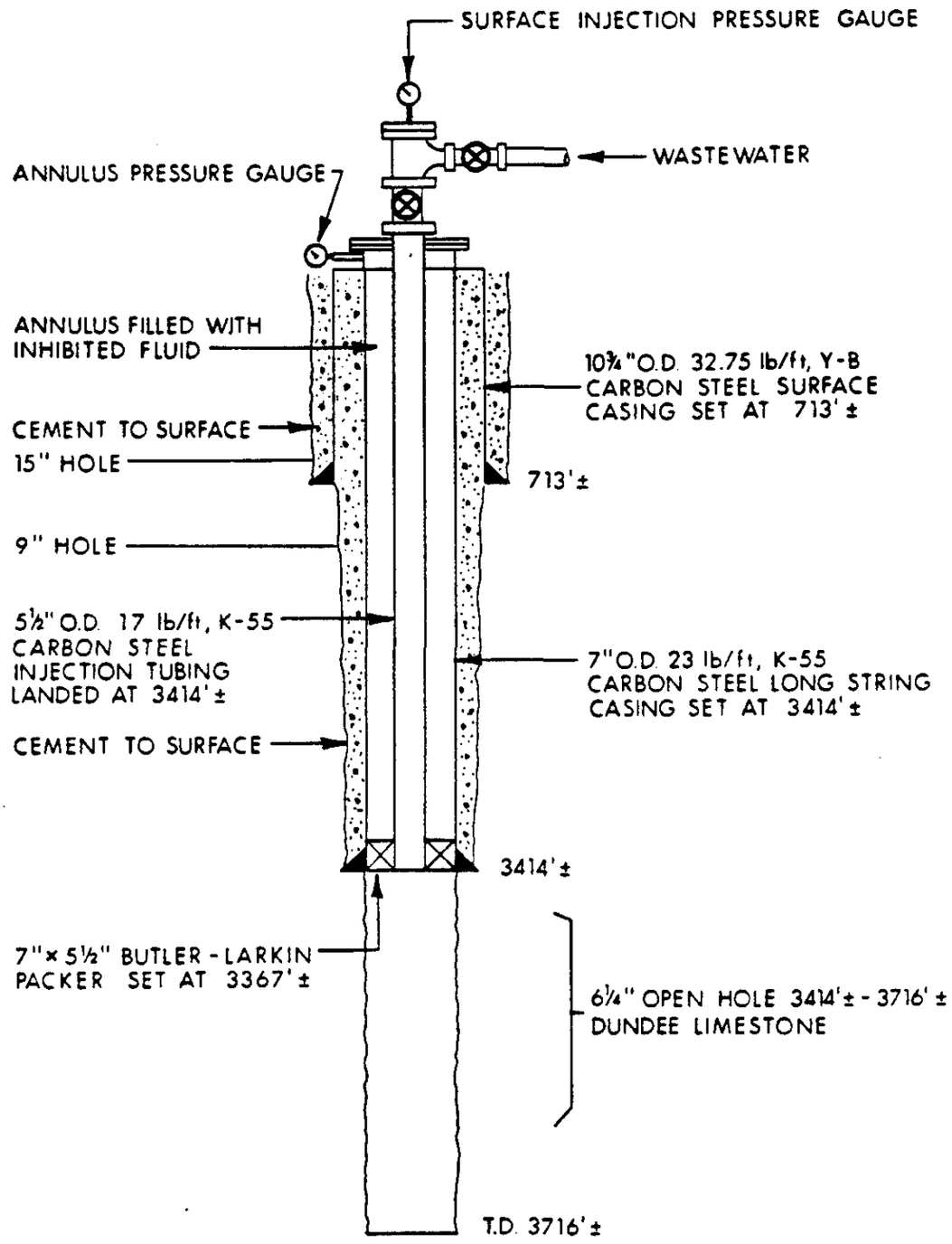
Sincerely,

Steven P. Noffke
Cased Hole Service Manager

cc: Conestoga-Rovers & Assoc., Ltd.

P.O. Box 747 2204 Commerce Mt. Pleasant, MI 48858 Telephone (517) 773-4497

APPENDIX C



GOLDEN STRATA SERVICES, INC.
HOUSTON, TEXAS

VELSICOL CHEMICAL CORPORATION
ST. LOUIS, MICHIGAN

WELL DESIGN SCHEMATIC

SCALE NONE

DATE 10-84

APPENDIX D

Golden StrataServices, Inc.

#731 October 1, 1984

Al Rarick
Michigan Department of Natural Resources
Stevens T. Mason Building
Lansing, Michigan 48926

Dear Mr. Rarick:

It is requested that the Michigan Department of Natural Resources (MDNR) review the following mechanical integrity testing (MIT) program for Velsicol Chemical Company's Class I waste disposal well located in St. Louis, Michigan. The proposed MIT program will include:

a. Pressure test the 5 1/2" x 7" annulus to 500 psi for 30 minutes with 3% or less bleed off to indicate absence of significant leaks in the 5 1/2" tubing, 7" casing and packer.
b. Run a radioactive tracer (RAT) in lieu of the temperature or noise logs to indicate the absence of significant vertical fluid movement behind the 7" casing.

Running a RAT in lieu of temperature or noise logs has the following advantages:

1. A workover rig is not needed.
2. Tubing and packer are not removed to run a RAT.
3. A RAT is easier to interpret than other logs. It is perhaps the best tool to verify behind casing fluid migration.
4. Running a RAT does not jeopardize the integrity of the tubing and packer because they are not removed.
5. An annulus pressure test does not have to be re-run.
6. Very little down time is needed to run a RAT.
7. Most regulatory agencies accept RAT logs to demonstrate mechanical integrity in lieu of noise or temperature log.

1000 Louisiana • Suite [illegible] • Houston, Texas 77002 • 713/759-9764

This letter is written to comply with the State of Michigan, Mineral Well Act, Act No. . The projected date for demonstration of mechanical integrity is tentatively set for October 9, 1984. It is requested that a document certifying that the proposed plans are approved be issued as soon as possible so that project continuity can be maintained. If you have any questions please call me or Tom Jones at (713)759-9764, as timing on this project is essential.

Sincerely,

Martyn M. Turner

Martyn M. Turner
Senior Geologist

MMT-bs

cc: John Taylor, EPA