



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VI
HOUSTON BRANCH
6608 HORNWOOD DRIVE
HOUSTON, TEXAS 77074

INORGANIC QC CHECKLIST

Site KOPPERS, TEXARKANA

Contract No. LS-01-7066

Case No. 6021

Contractor ACCU-LOBS RESEARCH

Reviewed By M. EL-FEKY

Matrix WATER LOW CONCENTRATION

Date 7-10-86

Acct. # TEACHH129-SF # 6TFAJMP

Sample No.	<u>MFC-272</u>				
	<u>MFC-274</u>				

COMMENTS (To be completed by EPA Personnel)

1. Data Completeness	<input checked="" type="checkbox"/>	Acceptable	<input type="checkbox"/>	Provisional	<input type="checkbox"/>	Unacceptable
2. Instrument Calibration Tune	<input checked="" type="checkbox"/>	Acceptable	<input type="checkbox"/>	Provisional	<input type="checkbox"/>	Unacceptable
3. Interference Check Sample	<input checked="" type="checkbox"/>	Acceptable	<input type="checkbox"/>	Provisional	<input type="checkbox"/>	Unacceptable
4. Blank Analysis	<input checked="" type="checkbox"/>	Acceptable	<input type="checkbox"/>	Provisional	<input type="checkbox"/>	Unacceptable
5. Matrix Spikes	<input checked="" type="checkbox"/>	Acceptable	<input type="checkbox"/>	Provisional	<input type="checkbox"/>	Unacceptable
6. Duplicates	<input checked="" type="checkbox"/>	Acceptable	<input type="checkbox"/>	Provisional	<input type="checkbox"/>	Unacceptable
7. Field Blanks	<u>N/A</u>	Acceptable	<input type="checkbox"/>	Provisional	<input type="checkbox"/>	Unacceptable
8. Other		Acceptable	<input type="checkbox"/>	Provisional	<input type="checkbox"/>	Unacceptable

ADDITIONAL COMMENTS

DATA ARE COMPLETE - CASE IS ACCEPTABLE.

DOCUMENT INVENTORY

<u>Document Control #*</u>	<u>Document Type</u>	<u># pages</u>
<u>62-6021-6-0001</u>	Case File document inventory	1
<u>62-6021-6-0002</u>	Transmittal Letter (F 7033)	1
<u>NA - 0003</u>	Case Narrative	
<u>62-6021-6-0004</u>	Shipping air or bill of lading	1
<u>62-6021-6-0005</u>	Sample tags	4
<u>NA - 0006</u>	SMD forms (SAS samples)	
<u>62-6021-6-0007</u>	Chain-of-Custody Forms	1
<u>62-6021-6-0008</u>	Sample traffic reports	2
<u>62-6021-6-0009</u>	Sample log-in sheets (F 7005)	1
<u>62-6021-6-0010</u>	Weekly progress reports	1
<u>62-6021-6-0011</u>	Analysis data summaries (B6-B18)	8
<u>62-6021-6-0012</u>	Work Orders (F 7017 and F 7002)	2
<u>62-6021-6-0013</u>	Flame AA data sheets (F 7008)	16
<u>62-6021-6-0014</u>	Furnace AA data sheets (F 7006)	7
<u>62-6021-6-0015</u>	Mercury data sheets (F 7009)	1
<u>62-6021-6-0016</u>	Cyanide data sheets (F 7007)	1
<u>NA - 0017</u>	Percent solids data sheets (F 7016)	
<u>62-6021-6-0018</u>	Digestion sheets (F 7011 and F 7001)	2
<u>NA - 0019</u>	Redigestion sheets (F 7004)	
<u>NA - 0020</u>	Analyst logbook pages	
<u>62-6021-6-0021</u>	HGA injection logs (F 7014)	14
<u>NA - 0022</u>	pH extremes log (F 7010)	
<u>62-6021-6-0023</u>	Internal Chain-of-Custody (F 7003)	2
<u>62-6021-6-0024</u>	Spiking data (3807200 pages 5 & 6)	1
<u>62-6021-6-0025</u>	AA printer readouts	16
<u>62-6021-6-0026</u>	Mercury strip charts	4
<u>NA - 0027</u>	Computer printouts	
<u>62-6021-6-0028</u>	Quality Control samples	1
<u>62-6021-6-0029</u>	AA strip charts	28
<u>62-6021-6-0030</u>	Analytical spikes - HGA (F 7019)	7
<u>62-6021-6-0031</u>	QC Report Number (F 7024)	1
<u>62-6021-6-0032</u>	Case Log (F 7023)	1
<u>62-6021-6-0033</u>	Reporting Schedule (F 7026)	

* This number is recorded on each set of documents.

007200

F 7033

Transmittal Letter

Case Number: 6021

Date Received: 6/6/86

Date Reported: 7-3-86

Approval: Cathy Cairns
Cathy Cairns
Project Manager

007201

007202

FEDERAL EXPRESS

USE THIS AIRBILL FOR DOMESTIC SHIPMENTS WITHIN THE CONTINENTAL U.S.A. ALASKA AND HAWAII. COMPLETE PURPLE AREAS FOR ASSISTANCE. CALL 800-238-5355 TOLL FREE. SEE BACK OF FORM SET FOR COMPLETE PREPARATION INSTRUCTIONS.

SENDER'S FEDERAL EXPRESS ACCOUNT NUMBER 0787-0267-755 DATE 4/5/06

From (Your Name) Michael A. (MAD) Dresser Your Phone Number (Very Important) (412) 349-6651

Company Card Dresser Vape Department/Floor No. _____

Street Address 3445 FULMINE AVE

City ALTOONA State PA

To (Recipient's Name) Michael A. (MAD) Dresser Recipient's Phone Number (Very Important) (412) 349-6651

Company Card Dresser Vape Department/Floor No. _____

Exact Street Address (Use of P.O. Boxes or P.O. Zip Codes Will Delay Delivery and Result in Extra Charge) 3445 FULMINE AVE

City ALTOONA State PA

AIRBILL NO. 062687505 ZIP Street Address Zip Required (U.S. Int'l Zip Code)

YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE) 777742751

PAYMENT Bill Shipper Bill Recipient's FedEx Account No. Bill 3rd Party FedEx Account No. Bill Credit Card

0787-0267-1

SERVICES CHECK ONLY ONE BOX		DELIVERY AND SPECIAL HANDLING CHECK SERVICES REQUIRED		PACKAGES	WEIGHT	VOL. DECLARED	DATE	ZIP	FEDERAL EXPRESS USE
<input checked="" type="checkbox"/> PRIORITY 1 Overnight Delivery Using Your Packaging	<input type="checkbox"/> OVERNIGHT LETTER Overnight Delivery Using Our Packaging	<input type="checkbox"/> HOLD FOR PICK-UP Give the Federal Express address where you want package held to Section # if at right.	<input checked="" type="checkbox"/> DELIVER WEEKDAY	1	1.18		2006	15106	Base Charges
<input type="checkbox"/> OVERNIGHT DELIVERY USING OUR PACKAGING	<input type="checkbox"/> DELIVER SATURDAY (Extra charge applies)	<input type="checkbox"/> RESTRICTED ARTICLES SERVICE (U.S. and Standard Air Packages only. Extra charge applies)	<input type="checkbox"/> CONSTANT SURVEILLANCE SERVICE (CSS) (Extra charge applies)						Declared Value Charge
<input type="checkbox"/> STANDARD AIR Delivery not later than second business day	<input type="checkbox"/> DRY ICE (Up to 10 lbs. per package)	<input type="checkbox"/> OTHER SPECIAL SERVICE	<input type="checkbox"/> SATURDAY PICK-UP OR SATURDAY DROP-OFF (Extra charge applies)						Origin Agent Charge
SERVICE COMMITMENT PRIORITY 1 - Delivery is scheduled only next business morning in rural locations. It may take two or three business days if the destination is outside our primary service area. STANDARD AIR - Delivery is generally next business day or not later than second business day. It may take three to more business days if the destination is outside our primary service area.				Received At <input type="checkbox"/> Shipper's Door <input type="checkbox"/> Regular Stop <input type="checkbox"/> On-Call Stop <input checked="" type="checkbox"/> FedEx Loc					Street Address
				Federal Express Corp. Employee No. <u>18160</u>					City
				Date/Time Received <u>4/5/06</u>					State
				Received By: <u>X Candice Keitt</u>					Zip
				FedEx Employee Number					Total Charges
				Revision Date					

RECIPIENT'S COPY

4-6-06-6-005 15-1005 4/5/06 8/15

Project Code 6021 Station No. KTX-OW/AC-001 Month/Day/Year 06/05/86 Time 1230 Designate: G/Gr

Station Location <i>Observation well OW/AC</i>	Samplers (Signatures) <i>J.A. Lanthier</i>	Preservative: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <i>HNO₃ - pH < 2</i>
ANALYSES		
BOD	Anions	
Solids (TSS) (TDS) (SS)		
COD, TOC, Nutrients		
Phenolics		
Mercury		
Metals	+ Fe	<input checked="" type="checkbox"/>
Cyanide		
Oil and Grease		
Organics GC/MS		
Priority Pollutants		
Volatile Organics		
Pesticides		
Mutagenicity		
Bacteriology		
Remarks:		

Tag No. 6-04895 Lab Sample No. MFC 274

61-6021-6-0005

007203

Station Location <i>Monitor Well MW3</i>	Samplers (Signatures) <i>Jared A. Lanthier</i>	Preservative: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <i>HNO₃ - pH < 2</i>
ANALYSES		
BOD	Anions	
Solids (TSS) (TDS) (SS)		
COD, TOC, Nutrients		
Phenolics		
Mercury		
Metals	+ Fe	<input checked="" type="checkbox"/>
Cyanide		
Oil and Grease		
Organics GC/MS		
Priority Pollutants		
Volatile Organics		
Pesticides		
Mutagenicity		
Bacteriology		
Remarks:		

Project Code 6021 Station No. KTX-MW3-001 Month/Day/Year 06/04/86 Time 1515 Designate: G/Gr

Tag No. 6-04899 Lab Sample No. MFC 272

Station Location <i>Monitor Well MW3</i>	Samplers (Signatures) <i>Jared A. Lanthier</i>	Preservative: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <i>NaOH to pH > 12</i>
ANALYSES		
BOD	Anions	
Solids (TSS) (TDS) (SS)		
COD, TOC, Nutrients		
Phenolics		
Mercury		
Metals		
Cyanide		<input checked="" type="checkbox"/>
Oil and Grease		
Organics GC/MS		
Priority Pollutants		
Volatile Organics		
Pesticides		
Mutagenicity		
Bacteriology		
Remarks:		

Project Code 6021 Station No. KTX-MW3-001 Month/Day/Year 06/04/86 Time 1515 Designate: G/Gr

Tag No. 6-04892 Lab Sample No. MFC 272

007204

Project Code 6021	Station No KTX-0W14C -001	Month/Day/Year 06/05/86	Time 1230	Designate	Preservative: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NaOH - pH > 12
				Comp.	
Station Location Observation well aw14C				ANALYSES	
Samplers (Signatures) <i>[Signature]</i>				BOD	
				Anions	
				Solids (TSS) (TDS) (SS)	
				COD, TOC, Nutrients	
				Phenolics	
				Mercury	
				Metals	
				Cyanide	<input checked="" type="checkbox"/>
				Oil and Grease	
				Organics GC/MS	
				Priority Pollutants	
				Volatile Organics	
				Pesticides	
				Mutagenicity	
Bacteriology					
Remarks:					
Tag No 6-04894		Lab Sample No MFC 274			



U.S. ENVIRONMENTAL PROTECTION AGENCY HWI Sample Management Office

PO Box 818, Alexandria, VA 22313-703-557-2490 FTS/557-2490

Sample Number

MFC 272

INORGANICS TRAFFIC REPORT

<p>① Case Number: <u>6021</u> Sample Site Name/Code: _____ _____ _____ _____</p>	<p>② SAMPLE CONCENTRATION (Check One) <input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> Medium Concentration</p> <p>③ SAMPLE MATRIX (Check One) <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil/Sediment</p>	<p>④ Ship To: <u>ACULABS</u> <u>1435 W. 10th AV.</u> <u>WHEELING, W. VA. 26060</u> <u>80033</u></p> <p>Attn: <u>DEBRA MCPAL</u></p> <p>Transfer _____ Ship To: _____</p>
<p>⑤ Sampling Office: <u>W902</u> Sampling Personnel: _____ (Name) <u>J. LINDSEY</u> (Phone) <u>512 451151</u> Sampling Date: <u>6/4/06</u> (Begin) _____ (End) _____</p>	<p>⑥ Shipping Information: Name Of Carrier: <u>F.T.C.</u> Date Shipped: <u>6/1/06</u> Airbill Number: <u>67709435</u> <u>067 6021 505</u></p>	<p>⑨ ANALYSIS LAB: Recd by: <u>C. J. H. HALL</u> Date Recd: <u>6-6-06</u></p>
<p>⑦ Sample Description: (Check One) <input type="checkbox"/> Surface Water <input checked="" type="checkbox"/> Ground Water <input type="checkbox"/> Leachate <input type="checkbox"/> Mixed Media <input type="checkbox"/> Solids <input type="checkbox"/> Other: _____ (specify)</p> <p>MATCHES ORGANIC SAMPLE NO. _____</p>	<p>⑧ Mark Volume Level On Sample Bottle Check Analysis required <input checked="" type="checkbox"/> Total Metals <u>pH 4.2 (HNO₃)</u> <input checked="" type="checkbox"/> Cyanide <u>pH 7.2 (NaOH)</u></p>	<p>⑩ Sample Condition On Receipt: (eg. broken, leakage, chain of custody, etc.) <u>OK</u></p>

62-6021-6-0008

LAB FILE COPY



INORGANICS TRAFFIC REPORT

<p>① Case Number: <u>6071</u> Sample Site Name/Code: <u>WILSON ST. W. 18th W.</u> <u>UNION RIDGE, COLO.</u> <u>CO035</u></p>	<p>② SAMPLE CONCENTRATION (Check One) <input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> Medium Concentration</p> <p>③ SAMPLE MATRIX (Check One) <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil/Sediment</p>	<p>④ Ship To: <u>ARCULABS</u> <u>11455 W. 18th W.</u> <u>UNION RIDGE, COLO.</u> Attn: <u>David Horst</u></p> <p>Transfer Ship To:</p>
<p>⑤ Sampling Office: <u>VE L031</u> Sampling Personnel: (Name) <u>J.A. LANDISER</u> (Phone) <u>512 545 6651</u> Sampling Date: <u>06/05/86</u> (Begin) (End)</p>	<p>⑥ Shipping Information: Name Of Carrier: <u>FFC</u> Date Shipped: <u>06/05/86</u> Airbill Number: <u>062687905</u></p>	<p>⑨ ANALYSIS LAB: Recd by: <u>Connie Horst</u> Date Recd: <u>06/18/86</u></p>
<p>⑦ Sample Description: (Check One) <input type="checkbox"/> Surface Water <input checked="" type="checkbox"/> Ground Water <input type="checkbox"/> Leachate <input type="checkbox"/> Mixed Media <input type="checkbox"/> Solids (if so, specify) <input type="checkbox"/> Other</p> <p>MATCHES ORGANIC SAMPLE NO. <u>7169</u></p>	<p>⑧ Mark Volume Level On Sample Bottle Check Analysis required <input checked="" type="checkbox"/> Total Metals <u>16 pH < 2 (HNO₃)</u> <input checked="" type="checkbox"/> Cyanide <u>pH 7-12 (NaOH)</u></p>	<p>⑩ Sample Condition On Receipt: (eg. broken, leakage, chain of custody, etc.) <u>OK</u></p>

CEMENT VIT

LAB FILE COPY

802200

Accu-Labs Research, Inc.

SAMPLE LOG-IN SHEET

F 7005 Rev. A

DATE: 6-6-86

SAMPLE CUSTODIAN SIGNATURE: *Conni Smith*

DOCUMENT CONTROL # 62-6021-6-0009

CIRCLE THE APPROPRIATE RESPONSE:

- 1. Custody Seals on Shipping Containers present/~~absent~~
intact/~~not intact~~
- 2. Chain-of-Custody ~~present~~/absent
- 3. Sample Tags present/~~absent~~ tie-on/adhesive
Sample Tag Numbers ~~listed~~/~~not listed~~ on chain-of-custody
- 4. SMO Forms ~~present~~/absent
- 5. Bills of Lading ~~present~~/absent
- 6. Custody Seals on Sample Containers ~~present~~/absent
intact/~~not intact~~

CASE NUMBER 6021

AIRBILL NUMBER 062 687505

DATE RECEIVED	TIME RECEIVED	CHAIN-OF-CUSTODY RECORD NUMBER	SMO SAMPLE NUMBERS	CORRESPONDING		DOES INFORMATION ON CUSTODY RECORDS, TRAFFIC REPORTS, AND SAMPLE TAGS AGREE?	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC.
				SAMPLE TAG NUMBERS	ASSIGNED LAB NUMBERS		
6-6-86	8:15	6-7801	MFC 272	6-04892,6-04899	62-6021-2-1	✓	✓
✓	✓	✓	MFC 274	6-04894,6-04895	-2	✓	✓

LABORATORY WEEKLY REPORT
INORGANICS

Report No. 54

Laboratory Name ACCU-LABS RESEARCH

EPA Contract No. 68-01-7066

Date 6/2/86 to 6/7/86
(Monday) (Saturday)

Number of Samples Received this Week: 26 nos of 6/6/86

Case Number	Sample Number	Date Received	Discussion of Problems
2014F SAS	MFC 574 MFC 596 MFC 538 MFC 573 MFC 575 MFC 576 MFC 577 MFC 578 MFC 580 MFC 581 MFC 592 MFC 593 MFC 594 MFC 595 MFC 597 MFC 599	5/31/86	On sample MFC 576 - sample tag are listed as 23574, 23575 chain of custody form - Tag says 23754 and 23755. On sample MFC 594 we are missing Uranium / Thorium series bottle. Rec'd sample FE 019 for analysis. Leslie Brown gave okay to use sample.
6021	MFC 272 MFC 274	6/6/86	
6043	MFD 449 MFD 197 MFD 405 MFD 448 MFC 554 MFC 557 MFC 558 MFC 559	6/6/86	

007200

Narrative: When necessary, note problems in condition of sample, analysis of sample, sample identification, etc. (Use additional pages, if necessary.)

Eyda Hergemeier
Asst Project Manager

2-6021-6-0010

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

Date 7/3/86

COVER PAGE
INORGANIC ANALYSES DATA PACKAGE

Lab Name Accu-Labs Research
SOW No. 784

Case No. 6021
Q.C. Report No. 62

Sample Numbers

<u>EPA No.</u>	<u>Lab ID No.</u>	<u>EPA No.</u>	<u>Lab ID No.</u>
<u>MFC 272</u>	<u>62-6021-2-1</u>		
<u>MFC 274</u>	<u>62-6021-2-2</u>		

Comments:

Background correction used for analysis
at less than 350nm.

ICP Interelement and background corrections applied? Yes No

If yes, corrections applied before _____ or after _____ generation of raw data.

Footnotes:

NR - not required by contract at this time

Form I:

Value - If the result is a value greater than or equal to the instrument detection limit but less than the contract required detection limit, report the value in brackets (i.e., [10]). Indicate the analytical method used with P (for ICP/Flame AA) or F (for furnace).

U - Indicates element was analyzed for but not detected. Report with the detection limit value (e.g., 10U).

E - Indicates a value estimated or not reported due to the presence of interference. Explanatory note included on cover page.

s - Indicates value determined by Method of Standard Addition.

R - Indicates spike sample recovery is not within control limits.

* - Indicates duplicate analysis is not within control limits.

+ - Indicates the correlation coefficient for method of standard addition is less than 0.995

007210

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No.
MFC 272

Date 7/3/86

INORGANIC ANALYSIS DATA SHEET

LAB NAME ACCU-LABS RESEARCH

CASE NO. 6021

SOW NO. 784

LAB SAMPLE ID. NO. 62-6021-2-1

QC REPORT NO. 62

Elements Identified and Measured

Concentration: Low X Medium _____
Matrix: Water X Soil _____ Sludge _____ Other _____

ug/L or mg/kg dry weight (Circle One)

1. Aluminum	<u>770 P*</u>	13. Magnesium	<u>[2040] P</u>
2. Antimony	<u>60UF 'R'</u>	14. Manganese	<u>1220 P 'R'</u>
3. Arsenic	<u>10UF</u>	15. Mercury	<u>0.2 U</u>
4. Barium	<u>200 UP</u>	16. Nickel	<u>20UP</u>
5. Beryllium	<u>5UP</u>	17. Potassium	<u>[1760] P</u>
6. Cadmium	<u>8 P</u>	18. Selenium	<u>5UF</u>
7. Calcium	<u>7700 P</u>	19. Silver	<u>5UP</u>
8. Chromium	<u>[8] P</u>	20. Sodium	<u>18700 P</u>
9. Cobalt	<u>20UP</u>	21. Thallium	<u>10UF</u>
10. Copper	<u>5UP</u>	22. Tin	<u>400UF 'R'</u>
11. Iron	<u>26300 P</u>	23. Vanadium	<u>50UF 'R'</u>
12. Lead	<u>5UP^{MF}</u>	24. Zinc	<u>587 P</u>
Cyanide	<u>10UF 10U</u>	Percent Solids (%)	_____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: _____

Lab Manager Cathy Cairns

007211

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No.
MFC 274

Date 7/3/86

INORGANIC ANALYSIS DATA SHEET

LAB NAME ACCU-LABS RESEARCH

CASE NO. 6021

SOW NO. 784

LAB SAMPLE ID. NO. 62-6021-2-2

QC REPORT NO. 62

Elements Identified and Measured

Concentration: Low X Medium _____
Matrix: Water X Soil _____ Sludge _____ Other _____

ug/L or mg/kg dry weight (Circle One)

1. Aluminum	<u>7480 P *</u>	13. Magnesium	<u>[4870] P</u>
2. Antimony	<u>60 U F 'R'</u>	14. Manganese	<u>449 P 'R'</u>
3. Arsenic	<u>10 U F</u>	15. Mercury	<u>0.2 U</u>
4. Barium	<u>200 U P</u>	16. Nickel	<u>60 P</u>
5. Beryllium	<u>5 U P</u>	17. Potassium	<u>7700 P</u>
6. Cadmium	<u>6 P</u>	18. Selenium	<u>5 U F</u>
7. Calcium	<u>8140 P</u>	19. Silver	<u>5 U P</u>
8. Chromium	<u>47 P</u>	20. Sodium	<u>72600 P</u>
9. Cobalt	<u>20 U P</u>	21. Thallium	<u>10 U F</u>
10. Copper	<u>1137 P</u>	22. Tin	<u>40 U F 'R'</u>
11. Iron	<u>14100 P</u>	23. Vanadium	<u>50 U F 'R'</u>
12. Lead	<u>8 P F</u>	24. Zinc	<u>97 P</u>
Cyanide	<u>10 U</u>	Percent Solids (%)	_____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: _____

Lab Manager Cathy Cairns

007212

Form II

Q. C. Report No. 62

INITIAL AND CONTINUING CALIBRATION VERIFICATION³

LAB NAME ACCU-LABS RESEARCH

CASE NO. 6021

SOW NO. 784

DATE 7/3/86

UNITS ug/L

Compound Initial Calib.¹ Continuing Calibration²

Metals:	True Value	Found	ZR	True Value	Found	ZR	Found	ZR	Method ⁴	Source
1. Aluminum	700	700	100	700	770	110			P	12
2. Antimony	101	98	97	101	105	104	98	97	F	13
3. Arsenic	27	27	100	27	25	93	25	93	F	11
4. Barium	1200	1200	100	1200	1200	100			P	8
5. Beryllium	235	221	94	235	227	97			P	12
6. Cadmium	39	40	103	39	40	103			F	12
7. Calcium	5300	5400	102	5300	5300	100			P	15
8. Chromium	261	259	99	261	249	95			P	12
9. Cobalt	260	260	100	260	260	100			P	12
10. Copper	339	324	96	339	325	96			P	12
11. Iron	800	790	99	800	810	101			P	12
12. Lead	43	39	91	43	39	91	41	95	F	11
13. Magnesium	1800	1750	97	1800	1710	95			P	15
14. Manganese	348	344	99	348	347	100			P	12
15. Mercury	300	334	111	300	334	111	310	103		5
16. Nickel	210	190	90	210	200	95			P	12
17. Potassium	2100	2000	95	2100	2100	100			P	15
18. Selenium	50	45	90	50	45	90	45	90	F	12
19. Silver	34	33	97	34	36	106			P	14
20. Sodium	8200	8200	100	8200	8100	99			P	15
21. Thallium	25	26	104	25	26	104	27	108	F	13
22. Tin	50	49	98	50	47	94	60	120	F	9
23. Vanadium	129	133	103	129	126	98	130	101	F	11
24. Zinc	418	405	97	418	406	97			P	12
Other:										
Cyanide	100	104	104	100	103	103				

007213

¹ Initial Calibration Source EPA's ² Continuing Calibration Source EPA's

³ Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

⁴ Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

Form III

Q. C. Report No. 62

BLANKS

LAB NAME ACCU-LABS RESEARCH

CASE NO. 6021

DATE 7/3/84

UNITS µg/L

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration				Preparation Blank	
		Blank Value				1	2
		1	2	3	4		
Metals:							
1. Aluminum	200u	200u				200u	
2. Antimony	5u	5u	5u			5u	
3. Arsenic	5u	5u	5u			5u	
4. Barium	200u	200u				200u	
5. Beryllium	5u	5u				5u	
6. Cadmium	5u	5u				5u	
7. Calcium	100u	100u				100u	
8. Chromium	5u	5u				5u	
9. Cobalt	20u	20u				20u	
10. Copper	5u	5u				5u	
11. Iron	20u	20u				30	
12. Lead	5u	5u	5u			5u	
13. Magnesium	50u	50u				50u	
14. Manganese	5u	5u				5u	
15. Mercury	0.2u	0.2u	0.2u			0.2u	
16. Nickel	20u	20u				20u	
17. Potassium	100u	100u				100u	
18. Selenium	5u	5u	5u			5u	
19. Silver	5u	5u				5u	
20. Sodium	100u	100u				100u	
21. Thallium	5u	5u				5u	
22. Tin	5u	5u	5u			5u	
23. Vanadium	5u	5u				5u	
24. Zinc	5u	5u				5u	
Other:							
Cyanide	10u	10u				10u	

007214

Form VII

Q.C. Report No. 62

INSTRUMENT DETECTION LIMITS AND
LABORATORY CONTROL SAMPLE

LAB NAME ACCU-LABS RESEARCH

CASE NO. 6021

DATE 7/3/84

LCS UNITS ug/L mg/kg

(Circle One)

Compound	Required Detection Limits (CRDL)-ug/l	Instrument Detection		Lab Control Sample		
		Limits (IDL)-ug/l ICP/AA	Furnace	True	Found	%R
Metals:						
1. Aluminum	200	200		700	770	110
2. Antimony	60		5	101	104	103
3. Arsenic	10		5	27	24	89
4. Barium	200	200		1200	1210	101
5. Beryllium	5	5		235	219	93
6. Cadmium	5	5		39	40	103
7. Calcium	5000	100		5300	5170	98
8. Chromium	10	5		261	254	97
9. Cobalt	50	20		260	260	100
10. Copper	25	5		339	331	98
11. Iron	100	20		800	890	111
12. Lead	5		5	43	38	88
13. Magnesium	5000	50		1800	1680	93
14. Manganese	15	5		348	351	101
15. Mercury	0.2	0.2		300	326	109
16. Nickel	40	20		210	210	100
17. Potassium	5000	100		2100	2420	115
18. Selenium	5		5	50	40	80
19. Silver	10	5		34	35	103
20. Sodium	5000	100		8200	8470	103
21. Thallium	10		5	25	27	108
22. Tin	40		5	50	49	98
23. Vanadium	50		5	129	123	95
24. Zinc	20	5		418	412	99
Other:						
Cyanide	10	10		100	94	94

007215

Form VI

Q. C. Report No. 62

DUPLICATES

LAB NAME Accu-Labs Research

CASE NO. 6021

EPA Sample No. MFC 272

DATE 7/3/86

Lab Sample ID No. 62-6021-2-1

Units µg/L

Matrix water

Compound	Control Limit ¹	Sample(S)	Duplicate(D)	RPD ²
Metals:				
1. Aluminum		770	1100	35 *
2. Antimony		<60	<60	NC
3. Arsenic		<10	<10	NC
4. Barium		<200	<200	NC
5. Beryllium		<5	<5	NC
6. Cadmium		8	8	0
7. Calcium		7700	7700	0
8. Chromium		[8]	[8]	NC
9. Cobalt		<20	<20	NC
10. Copper		<5	<5	NC
11. Iron		26300	27300	4
12. Lead		<5	<5	NC
13. Magnesium		[2040]	[2060]	NC
14. Manganese		1220	1250	2
15. Mercury		<0.2	<0.2	NC
16. Nickel		<20	<20	NC
17. Potassium		[1760]	[1760]	NC
18. Selenium		<5	<5	NC
19. Silver		<5	<5	NC
20. Sodium		18700	17600	6
21. Thallium		<10	<10	NC
22. Tin		<400	<400	NC
23. Vanadium		<50	<50	NC
24. Zinc		587	596	2
Other:				
Cyanide		<10	<10	NC

007216

* Out of Control

¹ To be added at a later date.

$$^2 \text{ RPD} = \left[\frac{|S - D|}{((S + D)/2)} \right] \times 100$$

NC - Non calculable RPD due to value(s) less than CRDL

Form V

Q. C. Report No. 62

SPIKE SAMPLE RECOVERY

LAB NAME Reu. Labs Research

CASE NO. 6021

DATE 7/3/86

EPA Sample No. MFC 274

Lab Sample ID No. 62-6021-2-2

Units µg/L

Matrix water

Compound	Control Limit ZR	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	ZR'
Metals:					
1. Aluminum	75-125	9460	7480	2000	99
2. Antimony	"	26	<60	50	52 'R'
3. Arsenic	"	16	<10	20	80
4. Barium	"	1870	<200	2000	94
5. Beryllium	"	46	<5	50	92
6. Cadmium	"	64	6	50	116
7. Calcium	"	109000	8140	100,000	101
8. Chromium	"	253	47	200	103
9. Cobalt	"	520	<20	500	104
10. Copper	"	263	[13]	250	105
11. Iron	"	15800	14100	1000	170
12. Lead	"	11329	8	20	105
13. Magnesium	"	50200	[4870]	50000	100
14. Manganese	"	738	449	200	145 'R'
15. Mercury	"	1.0	<0.2	1.0	100
16. Nickel	"	460	60	400	100
17. Potassium	"	61600	7700	50000	108
18. Selenium	"	10	<5	10	100
19. Silver	"	59	<5	50	118
20. Sodium	"	1165000	72600	100000	92
21. Thallium	"	41	<10	50	82
22. Tin	"	132	<40	200	66 'R'
23. Vanadium	"	70	[13]	50	140 'R'
24. Zinc	"	307	97	200	105
Other:					
Cyanide	"	EM 100 90	<10	EM 100	90

sample 5 times greater than spike

ZR = [(SSR - SR)/SA] x 100

'R' - out of control

Comments:

007217

due 7/6/86

Accu-Labs Research, Inc.

F 7017 Rev. B

EPA Work Order
Cyanide and Percent Solids

Location 3

ALR # 602 - 6021-2

Sample Type H2O

Case # 6021

Preservation & Volume 2-L NaOH

Date Received 6-6-86

<u>Analysis</u>	<u>In Progress</u>	<u>Completed</u>	<u>Comments</u>
<input checked="" type="checkbox"/> Cyanide due <u>6/20/86</u>	<u>6-13-86 DS</u>	<u>6-20-86 DS</u>	
<input type="checkbox"/> Percent Solids			

007218

Chain of Custody
Cyanide Extracts

Sample Numbers	Sample pH >12?	Distilled & Refrigerated	Analyst	Coloration	Analyst	Removed to Storage	Analyst
		Date/Time		Date/Time		Date/Time	
#1	7.2 ✓	10:15 AM 6-13-86 DS		"			
#2		6-14-86 DS 8:10 AM		6-20-86 9:30 AM	DS		

62-6021-60012

due 7/16/86

Accu-Labs Research, Inc.

F 7002 Rev. A

EPA Metals Work Order

Date Received 6-6-86

ALR # 67 - 6021-2

Location 3rd T

Case # 6021

Sample Type H2O

Extracts to AA Room: Analyst JP

Preservation and Volume 2-LHNO3

Date/Time 6/10/86 4:30pm

Digestion in progress 6/16/86

Extracts to Storage: Analyst _____

Date Digestion completed 6/17/86

Date/Time _____

Element	Completed	In Progress	Comments
<input checked="" type="checkbox"/> Aluminum	6-30		
<input checked="" type="checkbox"/> Antimony	7/3		
<input checked="" type="checkbox"/> Arsenic	6/30		
<input checked="" type="checkbox"/> Barium	6-30		
<input checked="" type="checkbox"/> Beryllium	6-30		
<input checked="" type="checkbox"/> Cadmium	6-23		
<input checked="" type="checkbox"/> Calcium	6-27		
<input checked="" type="checkbox"/> Chromium	6-23		
<input checked="" type="checkbox"/> Cobalt	6-26		
<input checked="" type="checkbox"/> Copper	6-23		
<input checked="" type="checkbox"/> Iron	6-24		
<input checked="" type="checkbox"/> Lead	6/25/86		
<input checked="" type="checkbox"/> Magnesium	6-27		
<input checked="" type="checkbox"/> Manganese	6-26		
<input checked="" type="checkbox"/> Mercury	6-19-86	✓	
<u>due</u>			
<input checked="" type="checkbox"/> Nickel	6-26		
<input checked="" type="checkbox"/> Potassium	6-27		
<input checked="" type="checkbox"/> Selenium	7/2/86		
<input checked="" type="checkbox"/> Silver	6-25		
<input checked="" type="checkbox"/> Sodium	6-24		
<input checked="" type="checkbox"/> Thallium	7/1		
<input checked="" type="checkbox"/> Tin	7/3		
<input checked="" type="checkbox"/> Vanadium	6/26		
<input checked="" type="checkbox"/> Zinc	6-25		

Redigestions

Extracts to AA Room			Extracts to Storage		
Date	Time	Analyst	Date	Time	Analyst

007219

Flame Atomic Absorption

Element: Al Procedure No. 3807203 Date: 6-30-86 Time 1800
 Wavelength: 309.3 nm BG PE 560 No. 82040 Analyst: AKW
 Matrix: XCL I.D.L.: 0.2 (ppm)
 Water Soil Other Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-30-86 Prepared by: AKW

	Initial	Recalibration
Calibration Blank	0.0	0.0
Standard 1	1.0	1.0
Standard 2	5.0	5.0
Standard 3	10.0	10.0

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading	Concentration (ppm)	ug/L
	Initial Calib.	X	X	X	X	X
	Calib. Verification	1.0	1.0	0.7	100%	700
	Calib. Blank		1.0	0.0	20.2	200
	Reagent Blank		1.1	0.0	20.2	<200
	LCS		1.1	0.7	110%	770
MFD 458	58-2014-3		1.1	0.2	0.2	
MFD 459	-4		1.0	1.5	165	
MFD 460	-5		1.1	6.9	7.6	
	-55			9.0	110%	
MFC 272	62-6021-1			0.7	0.8	970
	-1R			1.0	1.1	1100
MFC 274	-2			6.8	7.5	7480
	-25			8.6	99%	9460
	Calib. Verification		1.0	0.7	100%	
	Calib. Blank		1.0	0.0	20.2	
MFD 449	63-6043-1		1.1	0.1	20.2	
	-1R			0.1	20.2	
	-15			1.6	88%	
	Recalibration	X	X	X	X	X
	Calib. Verification	1.0	1.0	0.7	100%	
	Calib. Blank	1.0	1.0	0.0	20.2	

LCS and Calibration Verification: 284 I #2 True Value: 0.7 (ppm)

CRDL: 200 (ppb)

Spike = 0.2 mL of 1000 mg/L std. in final volume of 100 mL = 2.0 mg/L spike

Comments: Analyst Checked: AKW Date: 6-30-86

Q.C. Approved: E.H. Date: 7/2/86

Flame Atomic Absorption

Element: Ba Procedure No. 3807206 Date: 6-28-86 Time 850
 Wavelength: 553.6 nm BG PE 560 No. 82040 Analyst:
 Matrix: KCl I.D.L.: 0.2 (ppm)
 Water Soil Other Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-28-86 Prepared by:

	Initial	Recalibration
Calibration Blank	0.0	0.0
Standard 1	1.0 abs = 0.015	1.0
Standard 2	5.0	5.0
Standard 3	10.0	10.0

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading	Concentration (ppm)	µg/L
	Initial Calib.	X	X	X	X	
	Calib. Verification	1.0	1.0	1.2	100%	1200
	Calib. Blank		1.0	0.0	<0.2	<200
	Reagent Blank		1.1	0.0	<0.2	<200
	LCS		1.1	1.1	101%	1210
MFD 458	58-2014-3		1.1	0.1	<0.2	
MFD 459	-4			0.0		
MFD 460	-5			0.0		
	-55			1.6	88%	
MFC 272	62-6021-1			0.0	<0.2	<200
	-1R			0.0		<200
MFC 274	-2			0.0		<200
	-25			1.7	94.86%	1870
	Calib. Verification		1.0	1.2	100%	
	Calib. Blank		1.0	0.0	<0.2	
MFD 449	63-6043-1		1.1	0.0	<0.2	
	-1R			0.0	<0.2	
	-15			1.7	94%	
	Recalibration	X	X	X	X	
	Calib. Verification	1.0	1.0	1.2	100%	
	Calib. Blank	1.0	1.0	0.0	<0.2	

LCS and Calibration Verification: 581-1 111 True Value: 1.2 (ppm)

CRDL: 200 (ppb)

Spike = 0.2 mL of 1000 mg/L std. in final volume of 100 mL = 2.0 mg/L spike

Comments:

Analyst Checked: Date: 6-30-86

Q.C. Approved: E.H. Date: 7/2/86

Flame Atomic Absorption

Element: Be Procedure No. 3807207 Date: 6-30-86 Time 12:40
 Wavelength: 234.9 nm BG PE 560 No. 82040 Analyst: AKW
 Matrix: _____ D2 I.D.L.: 0.005 (ppm)
 Water Soil _____ Other _____ Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-30-86 Prepared by: AKW

	Initial	Recalibration
Calibration Blank	0.000	0.000
Standard 1	0.500 abs = 0.087	0.500
Standard 2	1.000	1.000
Standard 3	2.000	2.000

2222

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading	Concentration (ppm)
	Initial Calib.	X	X	X	X
	Calib. Verification	1.0	1.0	0.221	94%
	Calib. Blank			0.000	< 0.005
	Reagent Blank			0.000	< 0.005
	LCS		↓	0.219	93%
MFD 458	58-2014-3		1.0	0.000	< 0.005
MFD 459	-4			0.010	0.010
MFD 460	-5			0.000	< 0.005
	-5s			0.045	90%
MFC 272	62-6021-1			0.000	< 0.005
	-1R			0.000	< 0.005
MFC 274	-2			0.000	< 0.005
	-2s		↓	0.046	92%
	Calib. Verification		1.0	0.227	97%
	Calib. Blank		1.0	0.000	< 0.005
MFD 449	63-6043-1		1.0	0.000	< 0.005
	-1R			0.000	< 0.005
	-1s		↓	0.046	92%
	Recalibration	X	X	X	X
	Calib. Verification	1.0	1.0	0.228	97%
	Calib. Blank	1.0	1.0	0.000	< 0.005

LCS and Calibration Verification: 284-I 42 True Value: 0.235 (ppm)

CRDL: 5 (ppb)

Spike = 0.1 mL of 50 mg/L std. in final volume of 100 mL = 0.050 mg/L spike

Comments:

Analyst Checked: AKW Date: 6-30-86

Q.C. Approved: JoH Date: 7/2/86

Flame Atomic Absorption

Element: cd Procedure No. 3907208 Date: 6-23-86 Time 1117
 Wavelength: 228.8 nm BG V PE 560 No. 82040 Analyst: RLW
 Matrix: _____ I.D.L.: 0.005 (ppm)
 Water ✓ Soil _____ Other D₂ Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-23-86 Prepared by: RLW

	Initial	Recalibration
Calibration Blank	0.000	0.000
Standard 1	0.500 abs = 0.063	0.500
Standard 2	1.000	1.000
Standard 3	2.000	2.000

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading	Concentration (ppm)	μg/L
	Initial Calib.	X	X	X	X	
	Calib. Verification	1.0	1.0	0.040	103%	40
	Calib. Blank		1	0.001	<0.005	<5
	Reagent Blank		1	0.002	<0.005	<5
	LCS			0.040	103%	40
MFD 458	58-2014-3			0.000	<0.005	
MFD 459	-4		1	0.027	0.027	
MFD 460	-5		1	0.024	0.024	
	-55		1	0.084	114%	
MFC 272	62-6021-1			0.008	0.008	8
	-1R		1	0.008	0.008	8
MFC 274	-2		1	0.006	1.006	6
	-25		1	0.064	114%	64
	Calib. Verification		1	0.040	103%	
	Calib. Blank		1	0.001	<0.005	
MFD 449	63-6043-1		1	0.004	<0.005	
	-1R		1	0.003	<0.005	
	-15	✓	4	0.060	120%	
	Recalibration	X	X	X	X	
	Calib. Verification	1.0	1.0	0.040	103%	
	Calib. Blank	1.0	1.0	0.002	<0.005	

LCS and Calibration Verification: 284-2 #2 True Value: 0.039 (ppm)

CRDL: 5 (ppb)

Spike = 0.10 mL of 50 mg/L std. in final volume of 100 mL = 0.050 mg/L spike

Comments:

Analyst Checked: RLW Date: 6-23-86

Q.C. Approved: SLH Date: 7/2/86

Flame Atomic Absorption

Element: Ca Procedure No. 3807251 Date: 6-27-86 Time 2:55
 Wavelength: 422.7 nm BG _____ PE 560 No. 82040 Analyst: JP
 Matrix: LACS I.D.L.: 0.1 (ppm)
 Water Soil _____ Other _____ Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-27-86 Prepared by: JP

	Initial	Recalibration
Calibration Blank	0.0	0.0
Standard 1	1.0 abs = 0.039	1.0
Standard 2	5.0	5.0
Standard 3	10.0	10.0

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading	Concentration (ppm)	ug/L
	Initial Calib.	X	X	X	X	
	Calib. Verification	1.0	1.0	5.4	5.4 102%	540
	Calib. Blank		1.0	0.0	0.1	<100
	Reagent Blank		1.1	0.0	0.1	<100
	LCS		1.1	4.7	5.2 98%	5170
MFD 458	58-2014-3		1.1	4.2	46.2	
MFD 459	-4		1.0	2.7	29.7	
MFD 460	-5		1.1	2.5	27.5	
	-55		1.0	1.2	132 105%	
MFC 272	62-6021-1		1.1	7.0	7.7	7700
	-1R		1.1	7.0	7.7 0%	7700
MFC 274	-2		1.1	7.4	8.1	8140
	-25		1.1	9.9	10.9 101%	10900
	Calib. Verification		1.0	5.3	5.3 100%	
	Calib. Blank		1.0	0.1	0.1	
MFD 449	63-6043-1		1.1	0.0	0.1	
	-1R		1.1	0.0	0.1 0%	
	-15		1.1	9.3	102.3 102%	
	Recalibration	X	X	X	X	
	Calib. Verification	1.0	1.0	5.3	5.3 100%	
	Calib. Blank	1.0	1.0	0.0	0.1	

LCS and Calibration Verification: 384.2 True Value: 53 (ppm)

CRDL: 5000 (ppb)

Spike = 510 mL of 1000 mg/L std. in final volume of 100 mL = 100 mg/L spike

Comments:

Analyst Checked: JP Date: 6-27-86

Q.C. Approved: Felt Date: 7/2/86

Flame Atomic Absorption

Element: Cr Procedure No. 380729 Date: 6-23-86 Time 4:40
 Wavelength: 252.9 nm BG _____ PE 560 No. 82040 Analyst: PLW
 Matrix: _____ I.D.L.: 0.005 (ppm)
 Water Soil _____ Other _____ Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-23-86 Prepared by: PLW

	Initial	Recalibration
Calibration Blank	0.000	0.000
Standard 1	0.500 abs =	0.500
Standard 2	1.000	1.000
Standard 3	2.000	2.000

EPA No.	Sample Number	Aliquot	Dilution		Reading	Concentration (ppm)	
			Factor	Factor			
	Initial Calib.	X	X	X			
	Calib. Verification	1.0	1.0	0.259	99%	250	
	Calib. Blank			0.000	<0.005	<5	
	Reagent Blank			0.004	<0.005	<5	
	LCS			0.259	97%	254	
MFD 458	58-2014-3			0.004	<0.005		
MFD 459	-4			0.130	0.130		
MFD 460	-5			0.019	0.019		
	-55			0.229	105%		
MFC 272	22-6021-1			0.008	0.008	8	
	-1R			0.008	0.008	8	
MFC 274	-2			0.047	0.047	47	
	-25			0.253	103%	253	
	Calib. Verification			0.249	98%		
	Calib. Blank			0.001	<0.005		
MFD 449	43-6043-1			0.000	<0.005		
	-1R			0.002	<0.005		
	-15			0.207	104%		
	Recalibration	X	X	X	X		
	Calib. Verification	1.0	1.0	0.253	97%		
	Calib. Blank	1.0	1.0	0.002	<0.005		

LCS and Calibration Verification: 284-1 #2 True Value: 0.261 (ppm)

CRDL: 10 (ppb)

Spike = 1.0 mL of 20 mg/L std. in final volume of 100 mL = 0.200 mg/L spike

Comments:

Analyst Checked: PLW Date: 6-24-86

Q.C. Approved: F.H. Date: 7/2/86

Flame Atomic Absorption

Element: Co Procedure No. 3807210 Date: 6-26-86 Time 10:30am
 Wavelength: 240.7 nm BG BD PE 560 No. 82040 Analyst: JP
 Matrix: _____ I.D.L.: 0.02 (ppm)
 Water Soil _____ Other _____ Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-25-86 Prepared by: JP

	Initial	Recalibration
Calibration Blank	0.00	0.00
Standard 1	0.50 abs = 0.014	0.50
Standard 2	1.00	1.00
Standard 3	2.00	2.00

EPA No.	Sample Number	Alicquot	Dilution Factor	Reading	Concentration (ppm)	
	Initial Calib.	X	X	X	X	
	Calib. Verification	1.0	1	0.26	0.26 100%	24
	Calib. Blank			0.00	<0.02	<2
	Reagent Blank			0.01	<0.02	<20
	LCS			0.26	0.26 100%	26
MFD 458	58-2014-3			0.04	0.04	
MFD 459	-4			0.18	0.18	
MFD 460	-5			0.04	0.04	
	-55			0.51	0.51 94%	
MFC 272	62-6021-1			0.01	<0.02	<20
	-1R			0.01	0%	<20
MFC 274	-2			0.00	↓	<20
	-25			0.52	0.52 104%	52
	Calib. Verification			0.26	0.26 100%	
	Calib. Blank			0.00	<0.02	
MFD 449	63-6043-1			0.00	↓	
	-1R			0.01	↓ 0%	
	-15			0.50	0.50 100%	
	Recalibration	X	X	X	X	
	Calib. Verification	1.0	1	0.26	0.26 100%	
	Calib. Blank	1.0	1	0.00	<0.02	

LCS and Calibration Verification: 284-I #2 True Value: 0.261 (ppm)

CRDL: 50 (ppb)

Spike = 1.0 mL of 50 mg/L std. in final volume of 100 mL = 0.50 mg/L spike

Comments: _____ Analyst Checked: JP Date: 6-26-86

Q.C. Approved: JEH Date: 7/2/86

Flame Atomic Absorption

Element: Li Procedure No. 3807221 Date: 6-23-86 Time 3:15
 Wavelength: 324.7 nm BG ✓ PE 560 No. 82040 Analyst: SLW
 Matrix: _____ I.D.L.: 0.005 (ppm)
 Water ✓ Soil _____ Other D₂ Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-23-86 Prepared by: SLW

	Initial	Recalibration
Calibration Blank	0.000	0.000
Standard 1	1.500 abs =	0.500
Standard 2	1.000	1.000
Standard 3	2.000	2.000

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading	Concentration (ppm)	
	Initial Calib.	X	X	X	X	
	Calib. Verification	1.0	1.0	0.324	96%	324
	Calib. Blank			0.002	< 0.005	< 5
	Reagent Blank			0.002	< 0.005	< 5
	LCS			0.331	98%	331
MFD 458	58-2014-3			0.000	< 0.005	
MFD 459	-4			0.017	0.017	
MFD 460	-5			0.068	0.068	
	-53			0.328	100%	
MFC 372	62-6021-1			0.003	< 0.005	< 5
	-1R			0.003	< 0.005	< 5
MFC 374	-2			0.013	0.013	13
	-23			0.263	100%	26
	Calib. Verification			0.325	96%	
	Calib. Blank			0.001	< 0.005	
MFD 449	63-6043-1			0.002	< 0.005	
	-1R			0.002	< 0.005	
	-13			0.252	101%	
	Recalibration	X	X	X	X	
	Calib. Verification	1.0	1.0	0.324	96%	
	Calib. Blank	1.0	1.0	0.003	< 0.005	

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LCS and Calibration Verification: 284-I #2 True Value: 0.339 (ppm)

CRDL: 25 (ppb)

Spike = 1.0 mL of 25 mg/L std. in final volume of 100 mL = 0.250 mg/L spike

Comments: _____ Analyst Checked: SLW Date: 6-24-86
 Q.C. Approved: E.H. Date: 7/2/86

Flame Atomic Absorption

Element: Fe Procedure No. 3807212 Date: 6-24-86 Time 1:45
 Wavelength: 244.3 nm BG ✓ PE 560 No. 82040 Analyst: LDW
 Matrix: _____ I.D.L.: 0.02 (ppm)
 Water ✓ Soil _____ Other _____ Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-23-86 Prepared by: LDW

	Initial	Recalibration
Calibration Blank	0.00	0.00
Standard 1	1.00 abs = 0.036	1.00
Standard 2	5.00	5.00
Standard 3	10.00	10.00

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading	Concentration (ppm)	
	Initial Calib.	X	X	X	X	
	Calib. Verification	1.0	1.0	0.79	0.79 99%	190
	Calib. Blank			0.00	<0.02	<20
	Reagent Blank			0.03	0.03	30
	LCS			0.89	111%	890
MFD 458	58-2014-3		1.0	3.20	3.2	
MFD 459	-4		100	2.94	294	
MFD 460	-5		10	8.21	8.2	
	-55		10	1.06	11	
MFC 272	62-6021-1			2.63	26	2630
	-1R			2.73	27	2730
MFC 274	-2			1.41	14	1410
	-25			1.58	170%	1580
	Calib. Verification		1.0	0.81	101%	
	Calib. Blank		1.0	0.00	<0.02	
MFD 449	63-6053-1			0.08	0.08	
	-1R			0.09	0.09	
	-15			1.63	154%	
	Recalibration	X	X	X	X	
	Calib. Verification	1.0	1.0	0.80	100%	
	Calib. Blank	1.0	1.0	0.00	<0.02	

LCS and Calibration Verification: 284-T #2 True Value: 0.80 (ppm)

CRDL: 100 (ppb)

Spike = 1.0 mL of 100 mg/L std. in final volume of 100 mL = 1.0 mg/L spike

Comments:

Analyst Checked: LDW Date: 6-24-86

Q.C. Approved: JEH Date: 7/2/86

Element: Ma Procedure No. 3807252 Date: 6-27-86 Time 1:20
 Wavelength: 288.2 nm BG BD PE 560 No. 82040 Analyst: JP
 Matrix: LACS I.O.L.: 0.05 (ppm)
 Water Soil Other Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-27-86 Prepared by: JP

	Initial	Recalibration
Calibration Blank	0.00	0.00
Standard 1	1.00 abs = 0.472	1.00
Standard 2	5.00	5.00
Standard 3	10.00	10.00

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading	Concentration (ppm)	
	Initial Calib.	X	X	X	X	
	Calib. Verification	1.0	1.0	1.75	1.75 97%	1750
	Calib. Blank		1.0	0.00	0.05	<50
	Reagent Blank		1.1	0.00	0.05	<50
	LCS		1.1	1.53	1.68 94%	1680
MFD 458	58-2014-3		11	3.93	43.2	
MFD 459	-4		110	1.63	179	
MFD 460	-5		1.1	9.38	10.3	
	-55		11	5.32	58.5	
MFC 272	62-6021-1		1.1	1.85	2.04	2040
	-1R		1.1	1.87	2.06 1%	2060
MFC 274	-2		1.1	4.43	4.87	4870
	-23		11	4.56	50.2 91%	5020
	Calib. Verification		1.0	1.71	1.71 95%	
	Calib. Blank		1.0	0.00	0.05	
MFD 449	63-6043-1		1.1	0.01	0.05	
	-1R		1.1	0.01	0.05	
	-13		11	4.03	44.3 89%	
	Recalibration	X	X	X	X	
	Calib. Verification	1.0	1.0	1.76	1.76 98%	
	Calib. Blank	1.0	1.0	0.00	0.05	

LCS and Calibration Verification: 384.2 True Value: 1.80 (ppm)

CRDL: 5000 (ppb)

Spike = 5 mL of 1000 mg/L std. in final volume of 100 mL = 50 mg/L spike

Comments:

Analyst Checked: JP Date: 6-27-86

Q.C. Approved: Felt Date: 7/2/86

Flame Atomic Absorption

Element: Mn Procedure No. 3807214 Date: 6-26-86 Time 1:00 pm
 Wavelength: 279.5 nm BG BD PE 560 No. 82040 Analyst: JP
 Matrix: _____ I.D.L.: 0.005 (ppm)
 Water Soil _____ Other _____ Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-25-86 Prepared by: JP

	Initial	Recalibration
Calibration Blank	0.000	0.000
Standard 1	0.500 abs = 0.009	0.500
Standard 2	1.000	1.000
Standard 3	2.000	2.000

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EPA No.	Sample Number	Aliquot	Dilution Factor	Reading	Concentration (ppm)	µg/L
	Initial Calib.	X	X	X		
	Calib. Verification	1.0	1	0.344	0.344 99%	349
	Calib. Blank			0.000	0.005	< 5
	Reagent Blank			0.000	0.005	< 5
	LCS			0.351	0.351 101%	351
MFD 458	58-2014-3		✓	0.124	0.124	
MFD 459	-4		10	1.752	17.52	
MFD 460	-5		1	0.307	0.307	
	-55			0.669	0.669 181%	
MFC 372	62-6021-1			1.224	1.224	1220
	-1R			1.247	1.247 29%	1250
MFC 374	-2			0.449	0.449	449
	-25			0.738	0.738 145%	738
	Calib. Verification			0.347	0.347 100%	
	Calib. Blank			0.000	0.005	
MFD 449	63-6043-1			0.002	0.005	
	-1R			0.001	0.005 6%	
	-13		✓	0.284	0.284 142%	
	Recalibration	X	X	X	X	
	Calib. Verification	1.0	1	0.350	0.350 101%	
	Calib. Blank	1.0	1	0.000	0.005	

LCS and Calibration Verification: 284-I #2 True Value: 0.348 (ppm)

CRDL: 15 (ppb)

Spike = 0.2 mL of 100 mg/L std. in final volume of 100 mL = 0.200 mg/L spike

Comments:

Analyst Checked: JP Date: 6-26-86
 Q.C. Approved: ELH Date: 7/2/86

Flame Atomic Absorption

Element: Ni Procedure No. 3807234 Date: 6-26-86 Time 8:30
 Wavelength: 232.0 nm BG BD PE 560 No. 82040 Analyst: JP
 Matrix: _____ I.D.L.: 0.02 (ppm)
 Water Soil _____ Other _____ Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-25-86 Prepared by: JP

	Initial	Recalibration
Calibration Blank	0.00	0.00
Standard 1	0.50 abs = 0.011	0.50
Standard 2	1.00	1.00
Standard 3	2.00	2.00

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading	Concentration (ppm)	
	Initial Calib.	X	X	X	X	194
	Calib. Verification	1.0	1	0.19	0.19 92%	190
	Calib. Blank			0.00	<0.02	<20
	Reagent Blank			0.00	<0.02	<20
	LCS			0.21	0.21 101%	210
MFD 458	58-2014-3			0.01	<0.02	
MFD 459	-4			0.25	0.25	
MFD 460	-5			0.03	0.03	
	-55			0.43	0.43 100%	
MFC 372	62-6021-1			0.00	<0.02	<20
	-1R			0.00	<0.02 0%	<20
MFC 374	-2			0.06	0.06	60
	-25			0.46	0.46 100%	460
	Calib. Verification			0.20	0.20 99%	
	Calib. Blank			0.00	<0.02	
MFD 449	63-6043-1			0.00		
	-1R			0.00	↓ 0%	
	-15		✓	0.39	0.39 98%	
	Recalibration	X	X	X	X	
	Calib. Verification	1.0	1	0.20	0.20 97%	
	Calib. Blank	1.0	1	0.00	<0.02	

LCS and Calibration Verification: 204-I#2 True Value: 0.207 (ppm)

CRDL: 40 (ppb)

Spike = 0.4 mL of 100 mg/L std. in final volume of 100 mL = 0.400 mg/L spike

Comments:

Analyst Checked: JP Date: 6-26-86

Q.C. Approved: EH Date: 7/2/86

Flame Atomic Absorption

Element: K Procedure No. 3807253 Date: 6-27-86 Time 11:00 am
 Wavelength: 766.5 nm BG _____ PE 560 No. 92040 Analyst: JP
 Matrix: LALS I.D.L.: 0.1 (ppm)
 Water Soil _____ Other _____ Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-27-86 Prepared by: JP

	Initial	Recalibration
Calibration Blank	0.0	0.0
Standard 1	1.0 abs = 0.109	1.0
Standard 2	5.0	5.0
Standard 3	10.0	10.0

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading	Concentration (ppm)	µg/L
	Initial Calib.	X	X	X	X	
	Calib. Verification	1.0	1.0	2.0	2.0 95%	200
	Calib. Blank		1.0	0.0	<0.1	<100
	Reagent Blank		1.1	0.0	<0.1	<100
	LCS		1.1	2.2	2.4 115%	2420
MFD 458	58-2014-3		1.1	1.4	1.5	
MFD 459	-4		1.1	2.7	3.0	
MFD 460	-5		1.1	9.0	9.9	
	-55		1.1	6.3	6.9 118%	
MFC 272	62-6021-1		1.1	1.6	1.8 118%	1760
	-1R		1.1	1.6	1.8 100%	1760
MFC 274	-2		1.1	7.0	7.7	7700
	-25		1.1	5.6	6.2 109%	6160
	Calib. Verification		1.0	2.1	2.1 100%	
	Calib. Blank		1.0	0.0	<0.1	
MFD 449	63-6043-1		1.1	0.0	<0.1	
	-1R		1.1	0.0	<0.1	
	-13		11.0	4.7	5.2 103%	
	Recalibration	X	X	X	X	
	Calib. Verification	1.0	1.0	2.1	2.1 100%	
	Calib. Blank	1.0	1.0	0.0	<0.1	

LCS and Calibration Verification: 384.2 True Value: 2.1 (ppm)

CRDL: 5000 (ppb)

Spike = 5 mL of 1000 mg/L std. in final volume of 100 mL = 50 mg/L spike

Comments: _____ Analyst Checked: JP Date: 7-1-86
 Q.C. Approved: JEH Date: 7/2/86

Flame Atomic Absorption

Element: Ag Procedure No. 3807235 Date: 6-25-86 Time 10:35 am
 Wavelength: 328.1 nm BG BD PE 560 No. 82040 Analyst: JP
 Matrix: _____ I.D.L.: 0.005 (ppm)
 Water Soil _____ Other _____ Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-25-86 Prepared by: JP

	Initial	Recalibration
Calibration Blank	0.000	0.000
Standard 1	0.100 abs = 0.013	0.100
Standard 2	0.500	0.500
Standard 3	1.000	1.000

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading	Concentration (ppm)
	Initial Calib.	X	X	X	X
	Calib. Verification	1	1	0.033	0.033 97%
	Calib. Blank			0.000	< 5
	Reagent Blank			0.000	< 5
	LCS			0.035	0.035 103%
MFD 458	58-2014-3			0.002	< 5
MFD 459	-4			0.013	0.013
MFD 460	-5			0.003	0.010 0.010
	-55			0.004	0.004 105%
MFC 272	62-6021-1			0.002	< 5
	-1R			0.002	< 5
MFC 274	-2			0.003	< 5
	-25			0.059	0.059 118%
	Calib. Verification			0.036	0.036 106%
	Calib. Blank			0.000	< 5
MFD 449	63-6043-1			0.000	< 5
	-1R			0.000	< 5
	-13			0.055	0.055 110%
	Recalibration	X	X	X	X
	Calib. Verification	1.0	1	0.036	0.036 106%
	Calib. Blank	1.0	1	0.000	< 5

LCS and Calibration Verification: 378.13 True Value: 0.034 (ppm)

CRDL: 10 (ppb)

Spike = 0.1 mL of 50 mg/L std. in final volume of 100 mL = 0.050 mg/L spike

Comments:

Analyst Checked: JP Date: 6-25-86

Q.C. Approved: JH Date: 7/2/86

Flame Atomic Absorption

Element: Na Procedure No. 3807254 Date: 6-28-86 Time 1050
 Wavelength: 589.0 nm BG _____ PE 560 No. 82040 Analyst: AKW
 Matrix: La/Cs I.D.L.: 0.1 (ppm)
 Water Soil _____ Other _____ Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-27-86 Prepared by: T.P.

	Initial	Recalibration
Calibration Blank	0.0	0.0
Standard 1	1.0 abs = 0.032	1.0
Standard 2	5.0	5.0
Standard 3	10.0	10.0

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading	Concentration (ppm)	
	Initial Calib.	X	X	X	X	
	Calib. Verification	1.0	1.0	8.2	100%	820
	Calib. Blank		1.0	0.0	<0.1	<100
	Reagent Blank		1.1	0.0	<0.1	100
	LCS		1.1	7.7	103%	847
MFD 458	58-2014-3		11	5.3	58	
MFD 459	-4		110	4.3	473	
MFD 460	-5		1100	1.2	1320	
	-55		1100	1.3	1430 110%	
MFC 272	62-6021-1		11	1.7	19	1870
	-1R		11	1.6	18	1760
MFC 274	-2		11	6.6	72	7260
	-2S		110	1.5	92%	16500
	Calib. Verification		1.0	8.1	99%	
	Calib. Blank		1.0	0.0	<0.1	
MFD 449	63-6043-1		1.1	0.1	0.1	
	-1R		1.1	0.1	0.1	
	-1S		11	9.1	100%	
	Recalibration	X	X	X	X	
	Calib. Verification	1.0	1.0	8.1	99%	
	Calib. Blank	1.0	1.0	0.0	<0.1	

LCS and Calibration Verification: 384-2 True Value: 8.2 (ppm)

CRDL: 5000 (ppb)

Spike = 10 mL of 1000 mg/L std. in final volume of 100 mL = 100 mg/L spike

Comments:

Analyst Checked: AKW Date: 6-28-86

Q.C. Approved: John Date: 7/2/86

Flame Atomic Absorption

Element: Zn Procedure No. 3807239 Date: 6-25-86 Time 2:50 pm
 Wavelength: 213.9 nm BG BD PE 560 No. 82040 Analyst: JP
 Matrix: _____ I.D.L.: 0.005 (ppm)
 Water Soil _____ Other _____ Page 2 of 2

STANDARDS (ppm)

Date Prepared: 6-25-86 Prepared by: JP

	Initial	Recalibration
Calibration Blank	0.000	0.000
Standard 1	0.500 abs = 0.093	0.500
Standard 2	1.000	1.000
Standard 3	2.000	2.000

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading	Concentration (ppm)	
	Initial Calib.	X	X	X	X	
	Calib. Verification	10	1	0.405	0.405 97%	405
	Calib. Blank			0.000	0.005	<5
	Reagent Blank			0.001	0.005	<5
	LCS			0.412	0.412 99%	412
MFD 458	58-2014-3			0.011	0.011	
MFD 459	-4			0.317	0.317	
MFD 460	-5		100	0.140	14.0	
	-55		10	0.375	3.75	
MFC 272	62-6021-1			0.587	0.587	587
	-1R			0.596	0.596 2%	596
MFC 274	-2			0.097	0.097	97
	-2S			0.307	0.307	307
	Calib. Verification			0.406	0.406 97%	
	Calib. Blank			0.000	0.005	
MFD 449	63-6043-1			0.004	0.005	
	-1R			0.003	0.005 0%	
	-1S			0.231	0.231 116%	
	Recalibration	X	X	X	X	
	Calib. Verification	1	1	0.404	0.404 97%	
	Calib. Blank	1	1	0.000	0.005	

LCS and Calibration Verification: 284-I #2 True Value: 0.418 (ppm)

CRDL: 20 (ppb)

Spike = 0.2 mL of 100 mg/L std. in final volume of 100 mL = 0.200 mg/L spike

Comments:

Analyst Checked: JP Date: 6-25-86

Q.C. Approved: F.H. Date: 7/2/86

HGA Atomic Absorption

Element: Sb Procedure No. 3807204 Date: 7/2/86 Time 12:15 pm
 Wavelength: 217.6 nm BG 6D PE 5000 No. 82067 Analyst: EH
 Matrix Modifier: PE 603 No. 82034 I.D.L.: 0.005 (ppm)
 Water Soil Other PE 5000Z No. 82143 Page 1 of 1

STANDARDS (ppm)
 Date Prepared: 7/2/86 Prepared by: EH

	Initial	Recalibration	Final
Calibration Blank	0.000	0.000	
Standard 1	0.050 abs = 0.08	0.050	
Standard 2	0.100	0.100	
Standard 3: (0.070)	0.065 % = 93	0.064 % = 91	% =

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading 1	Reading 2	Avg. Conc. (ppm)	
	Initial Calib.	X	X	X	X	X	
	Calib. Verification	1.0	1.0	0.098	0.099	0.098	97%
	Calib. Blank		1.0	0.000	0.000	<0.005	65
	Reagent Blank		1.0	0.000	0.000	<0.005	65
	LCS		1.0	0.103	0.105	0.104	103%
MFC 272	62-6021-1		1.0	0.000	0.000	<0.005	<6%
	-1E		1.0	0.000	0.000	<0.005	<6%
274	-2		1.0	0.000	0.000	<0.005	<6%
	Calib. Verification		1.0	0.106	0.104	0.105	104%
	Calib. Blank		1.0	0.000	0.000	<0.005	65
	62-6021-23		1.0	0.026	0.025	0.026	52%
MFD-449	63-6043-1		1.0	0.000	0.000	<0.005	
	-1E		1.0	0.000	0.000	<0.005	
	-1S		1.0	0.030	0.031	0.031	62%
	Recalibration	X	X	X	X	X	
	Calib. Verification	1.0	1.0	0.100	0.097	0.098	97%
	Calib. Blank	1.0	1.0	0.000	0.000	<0.005	
	Calib. Verification						
	Calib. Blank						
	Final Calibration	X	X	X	X	X	
	Calib. Verification						
	Calib. Blank						

I.C.S. and Calibration Verification: Fe PA 1183-II #2 True Value: 0.101 (ppm)
 CRDL: 60 (ppb)

Spike = 0.2 mL of 25 mg/L std. in final volume of 100 mL = 0.050 mg/L spike

Comments: Analyst Checked: EH Date: 7/2/86
 Q.C. Approved: EH Date: 7/3/86

62-6021-60-0014

HGA Atomic Absorption

Element: Pb Procedure No. 3807205 Date: 6/27/86 Time 9:00 Am
 Wavelength: 193.7 nm BG BD PE 5000 No. 82067 Analyst: EH
 Matrix Modifier: N₂, NO₃ PE 603 No. 82034 I.D.L.: 0.005 (ppm)
 Water Soil _____ Other _____ Page 1 of 1

STANDARDS (ppm)
 Date Prepared: 6/27/86 Prepared by: EH

	Initial	Recalibration	Final
Calibration Blank	0.000	0.000	
Standard 1	0.050 abs = 0.215	0.050	
Standard 2	0.100	0.100	
Standard 3: (0.070)	0.072 % = 103	0.074 % = 106	% =

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading 1	Reading 2	Avg. Conc. (ppm)	
	Initial Calib.	X	X	X	X	X	
	Calib. Verification	1.0	1.0	0.027	0.027	0.027 100%	7
	Calib. Blank		1.0	0.000	0.000	<0.005	25
	Reagent Blank		1.0	0.000	0.000	<0.005	20
	LCS		1.0	0.022	0.025	0.024 89%	20
MFC 272	62-6021-1		1.0	0.006	0.007	0.006	<10
	-1R		1.0	0.007	0.007	0.007	<10
274	-2		1.0	0.001	0.002	<0.005	<10
	Calib. Verification		1.0	0.026	0.025	0.025 93%	
	Calib. Blank		1.0	0.000	0.000	<0.005	
	62-6021-2s		1.0	0.017	0.015	0.016 80%	16
MFD 449	63-6043-1		1.0	0.000	0.000	<0.005	
	-1R		1.0	0.000	0.000	<0.005	
	-1s		1.0	0.014	0.001	0.012 60%	
	Recalibration	X	X	X	X	X	
	Calib. Verification	1.0	1.0	0.025	0.025	0.025 93%	
	Calib. Blank	1.0	1.0	0.000	0.000	<0.005	
	Calib. Verification						
	Calib. Blank						
	Final Calibration	X	X	X	X	X	
	Calib. Verification						
	Calib. Blank						

LCS and Calibration Verification: EPA 284-I #1 True Value: 0.027 (ppm)

CRDL: 10 (ppb)

Spike = 0.1 mL of 20 mg/L std. in final volume of 100 mL = 0.020 mg/L spike

Comments:

Analyst Checked: EH Date: 6/27/86

Q.C. Approved: EH Date: 7/2/86

HGA Atomic Absorption

Element: Pb Procedure No. 3807213 Date: 6/24/86 Time 10:00am
 Wavelength: 283.3 nm BG BD PE 5000 No. 82067 Analyst: F.H.
 Matrix Modifier: NH₄H₂PO₄ + Mg(NO₃)₂ PE 603 No. 82034 I.D.L.: 0.005 (ppm)
 Water Soil Other Page 1 of 1

STANDARDS (ppm)
 Date Prepared: 6/24/86 Prepared by: F.H.

	Initial	Recalibration	Final
Calibration Blank	0.000	0.000	
Standard 1	0.050 abs = 0.218	0.050	
Standard 2	0.100	0.100	
Standard 3: (0.070)	0.070 % = 100	0.072 % = 103	% =

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading 1	Reading 2	Avg. Conc. (ppm)	μg/L
	Initial Calib.	X	X	X	X	X	∞
	Calib. Verification	1.0	1.0	0.040	0.037	0.039 91%	39
	Calib. Blank		1.0	0.001	0.000	<0.005	<5
	Reagent Blank		1.0	0.003	0.003	<0.005	<50
	LCS		1.0	0.037	0.038	0.038 88%	380
MFC-272	62-6021-1		1.0	0.002	0.002	<0.005	<5
	-1R		1.0	0.002	0.003	<0.005	<5
274	-2		1.0	0.008	0.008	0.008	8
	Calib. Verification		1.0	0.041	0.038	0.039 91%	39
	Calib. Blank		1.0	0.000	0.000	<0.005	<5
	62-6021-23		1.0	0.028	0.029	0.029 105%	29
MFD 449	63-6043-1		1.0	0.000	0.000	<0.005	<5
	-1R		1.0	0.000	0.000	<0.005	<5
	-1S		1.0	0.023	0.023	0.023 115%	23
	Recalibration	X	X	X	X	X	
	Calib. Verification	1.0	1.0	0.040	0.041	0.041 95%	41
	Calib. Blank	1.0	1.0	0.000	0.000	<0.005	<5
	Calib. Verification						
	Calib. Blank						
	Final Calibration	X	X	X	X	X	
	Calib. Verification						
	Calib. Blank						

LCS and Calibration Verification: EPA 284-I #1 True Value: 0.043 (ppm)

CRDL: 5 (ppb)

Spike = 0.1 mL of 20 mg/L std. in final volume of 100 mL = 0.020 mg/L spike

Comments:

Analyst Checked: F.H. Date: 6/25/86

Q.C. Approved: F.H. Date: 6/25/86

HGA Atomic Absorption

Element: Se Procedure No. 3807216 Date: 7/2/86 Time 9:00 am
 Wavelength: 196.0 nm BG B2 PE 5000 No. 82067 Analyst: EH
 Matrix Modifier: N₂ NO₂ + Na NO₃ PE 603 No. 82034 I.D.L.: 0.005 (ppm)
 Water Soil Other PE 5000Z No. 82143 Page 1 of 1

Date Prepared: 7/2/86 STANDARDS (ppm) Prepared by: EH

	Initial	Recalibration	Final
Calibration Blank	0.000	0.000	
Standard 1	0.050 abs = 0.151	0.050	
Standard 2	0.100	0.100	
Standard 3: (0.070)	0.071 % = 101	0.069 % = 99	% =

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading 1	Reading 2	Avg. Conc. (ppm)	
	Initial Calib.	X	X	X	X	X	
	Calib. Verification	1.0	1.0	0.045	0.045	0.045 90%	45
	Calib. Blank		1.0	0.000	0.000	<0.005	<5
	Reagent Blank		1.0	0.000	0.000	<0.005	<5
	LCS		1.0	0.040	0.041	0.040 80%	40
MFC 272	62-6021-1		1.0	0.001	0.001	<0.005	<5
	-1R		1.0	0.000	0.001	<0.005	<5
MFC 274	-2		1.0	0.001	0.000	<0.005	<5
	Calib. Verification		1.0	0.045	0.045	0.045 90%	
	Calib. Blank		1.0	0.001	0.000	<0.005	
	62-6021-2S		1.0	0.010	0.010	0.010 100%	10
MFD 449	63-6043-1		1.0	0.000	0.001	<0.005	
	-1R		1.0	0.000	0.001	<0.005	
	-2S		1.0	0.002	0.003	0.003 30%	
	Recalibration	X	X	X	X	X	
	Calib. Verification	1.0	1.0	0.044	0.045	0.045 90%	
	Calib. Blank	1.0	1.0	0.001	0.001	<0.005	
	Calib. Verification						
	Calib. Blank						
	Final Calibration	X	X	X	X	X	
	Calib. Verification						
	Calib. Blank						

LCS and Calibration Verification: EPA 284-I #1 True Value: 0.050 (ppb)

CRDL: 5 (ppb)

Spike = 0.1 mL of 10 mg/L std. in final volume of 100 mL = 0.010 mg/L spike

Comments: Analyst Checked: EH Date: 7/2/86

Q.C. Approved: EH Date: 7/3/86

HGA Atomic Absorption

Element: TL Procedure No. 3807218 Date: 6/30/86 Time 8:00 am
 Wavelength: 276.5 nm BG BD PE 5000 No. 82057 Analyst: EH
 Matrix Modifier: PE 603 No. 82034 ✓ I.D.L.: 0.005 (ppm)
 Water Soil Other Page 1 of 1

STANDARDS (ppm)
 Date Prepared: 6/30/86 Prepared by: EH

	Initial	Recalibration	Final
Calibration Blank	0.000	0.000	
Standard 1	0.050 abs = 0.120	0.050	
Standard 2	0.100	0.100	
Standard 3: (0.070)	0.069 % = 99	0.071 % = 101	% =

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading 1	Reading 2	Avg. Conc. (ppm)	μg/L
	Initial Calib.	X	X	X	X	X	
	Calib. Verification	1.0	1.0	0.025	0.026	0.026 104%	28
	Calib. Blank		1.0	0.000	0.000	<0.005	<5
	Reagent Blank		1.0	0.000	0.000	<0.005	<5
	LCS		1.0	0.028	0.026	0.027 108%	28
MFC 272	62-6021-1		1.0	0.000	0.000	<0.005	<10
	-1R		1.0	0.000	0.000	<0.005	<10
274	-2		1.0	0.000	0.000	<0.005	<10
	Calib. Verification		1.0	0.025	0.026	0.026 104%	26
	Calib. Blank		1.0	0.000	0.000	<0.005	<5
	62-6021-23		1.0	0.041	0.040	0.041 82%	41
MFD 449	63-6043-1		1.0	0.000	0.000	<0.005	
	-1R		1.0	0.000	0.000	<0.005	
	-1S		1.0	0.061	0.062	0.061 122%	
	Recalibration	X	X	X	X	X	
	Calib. Verification	1.0	1.0	0.026	0.027	0.027 108%	
	Calib. Blank	1.0	1.0	0.000	0.000	<0.005	
	Calib. Verification						
	Calib. Blank						
	Final Calibration	X	X	X	X	X	
	Calib. Verification						
	Calib. Blank						

LCS and Calibration Verification: EPA 1123-T #1 True Value: 0.025 (ppm)

CRDL: 10 (ppb)

Spike = 0.050 mL of 50 mg/L std. in final volume of 100 mL = 0.050 mg/L spike

Comments:

Analyst Checked: EH Date: 6/30/86

Q.C. Approved: EH Date: 7/2/86

HGA Atomic Absorption

Element: Sn Procedure No. 3807219 Date: 7/2/86 Time 9:30am
 Wavelength: 224.6 nm BG BD PE 5000 No. 82067 Analyst: EH
 Matrix Modifier: PE 603 No. 82034 I.D.L.: 0.005 (ppm)
 Water Soil Other PE 5000Z No. 82143 Page 1 of 1

STANDARDS (ppm)
 Date Prepared: 7/2/86 Prepared by: EH

	Initial	Recalibration	Final
Calibration Blank	0.000	0.000	
Standard 1	0.100 abs = 0.271	0.100	
Standard 2	0.200	0.200	
Standard 3: (0.150)	0.140 % = 93	0.155 % = 103	% =

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading 1	Reading 2	Avg. Conc. (ppm)	
	Initial Calib.	X	X	X	X	X	
	Calib. Verification	1.0	1.0	0.048	0.049	0.049	98% 49
	Calib. Blank		1.0	0.000	0.000	<0.005	45
	Reagent Blank		1.0	0.001	0.000	<0.005	45
	ICS		1.0	0.049	0.049	0.049	98% 49
MFC 272	62-6021-1		1.0	0.000	0.000	<0.005	<40%
	-1R		1.0	0.000	0.000	<0.005	<40%
MFC 274	-2		1.0	0.001	0.003	<0.005	<4%
	Calib. Verification		1.0	0.049	0.045	0.049	94% 47
	Calib. Blank		1.0	0.000	0.000	<0.005	45
	62-6021-2S		1.0	0.130	0.134	0.132	66% 13
MFD 449	63-6043-1		1.0	0.007	0.005	0.006	
	-1R		1.0	0.000	0.000	<0.005	
	-1S		1.0	0.038	0.034	0.036	18%
	Recalibration	X	X	X	X	X	
	Calib. Verification	1.0	1.0	0.060	0.059	0.060	120%
	Calib. Blank	1.0	1.0	0.000	0.000	<0.005	
	Calib. Verification						
	Calib. Blank						
	Final Calibration	X	X	X	X	X	
	Calib. Verification						
	Calib. Blank						

ICS and Calibration Verification: American Scientific True Value: 0.050 (ppm)
 CRDL: 40 (ppb)
 Spike = 0.2 mL of 100 mg/L std. in final volume of 100 mL = 0.200 mg/L spike
 Comments: Analyst Checked: EH Date: 7/2/86
 Q.C. Approved: EH Date: 7/3/86

HGA Atomic Absorption

Element: V Procedure No. 3807220 Date: 6/26/86 Time 9:00am
 Wavelength: 318.4 nm BG AD PE 5000 No. 82067 Analyst: EH
 Matrix Modifier: PE 603 No. 82034 I.D.L.: 0.005 (ppm)
 Water soil Other Page 1 of 1

STANDARDS (ppm)
 Date Prepared: 6/26/86 Prepared by: EH

	Initial	Recalibration	Final
Calibration Blank	0.000	0.000	
Standard 1	0.050 abs = 0.099	0.050	
Standard 2	0.100	0.100	
Standard 3: (0.070)	0.075 % = 107	0.072 % = 103	% =

EPA No.	Sample Number	Aliquot	Dilution Factor	Reading 1	Reading 2	Avg. Conc. (ppm)	
	Initial Calib.	X	X	X	X	X	
	Calib. Verification	1.0	2	0.067	0.066	0.133	103%
	Calib. Blank		1	0.002	0.001	<0.005	
	Reagent Blank		1	0.000	0.000	<0.005	
	LCS		2	0.059	0.064	0.123	95%
MFC 272	62-6021-1		1	0.003	0.000	<0.005	<5
	-1R		1	0.000	0.000	<0.005	<5
274	-2		1	0.013	0.012	0.013	<5
	Calib. Verification		2	0.064	0.062	0.126	98%
	Calib. Blank		1	0.000	0.000	<0.005	<5
	62-6021-2S		1	0.070	0.071	0.070	114%
MFD 449	63-6043-1		1	0.000	0.000	<0.005	
	-1R		1	0.000	0.000	<0.005	
	-1S		1	0.051	0.054	0.052	104%
	Recalibration	X	X	X	X	X	
	Calib. Verification	1.0	2	0.068	0.062	0.130	101%
	Calib. Blank	1.0	1	0.000	0.000	<0.005	
	Calib. Verification						
	Calib. Blank						
	Final Calibration	X	X	X	X	X	
	Calib. Verification						
	Calib. Blank						

LCS and Calibration Verification: EPA 284-I #1 True Value: 0.129 (ppm)

CRDL: 50 (ppb)

Spike = 0.1 mL of 50 mg/L std. in final volume of 100 mL = 0.050 mg/L spike

Comments:

Analyst Checked: EH Date: 6/30/86

Q.C. Approved: EH Date: 7/2/86

Mercury - Cold Vapor Method

Wavelength: 253.7 nm

Procedure No. 3807240

Date: 6-19-86 Time: 8:50am

Water Soil Other

PE 503 No. 82066

Analyst: JP

Samples Digested and transferred to AA room:

I.D.L.: 0.0002 (ppm)

Date/Time 6-19-86 2:00pm Analyst JP

Page _____ of _____

Date Prepared: 6-19-86 STANDARDS

Prepared by: JP

	Concentration ()	Initial (nm)	Recalibration (nm)	Avg. (nm)
Calibration Blank	0.000	8	6	7
Standard 1	0.003	154	146	152.5
Standard 2	0.002	112	101	106.5
Standard 3	0.001	60	52	56
Standard 4	0.0005	36	29	32.5
Standard 5	0.0002	19	16	17.5
Standard 6				

EPA No.	Sample Number	Bottle Number	Aliquot	Dilution Factor	Reading (nm)	Concentration (ppm)	
	Initial Calib.	X	X	X	X	X	
	Calib. Verification	53	100	200	89	0.33 111%	334
	Reagent Blank	54		1	8	10.0002	10.2
	LCS	55		200	87	0.33 109%	326
	59-2014	5	56	1	12	10.0002	
		6	57		69	0.0013	
		65	58		117	0.023 100%	
		7	59		13	10.0002	
	60-2014	1	60		21	0.0005	
		1R	61		57	0.0010 166%	
		2	62		31	0.0005	
		3	63	✓	11	10.0002	
	Calib. Verification	64		200	89	0.33 111%	334
	Calib. Blank	65			10	10.0002	
		35	66		57	0.001 100%	
	61-2014	1	67		7	10.0002	<0.2
		1R	68		8	10.0002 0%	<0.2
		2	69		27	0.0004	0.4
		25	70		35	0.0006 16%	0.6
mFC 272	62-6021	1	71		9	10.0002	<0.2
		1R	72		7	10.0002 0%	<0.2
mFC 274		2	73		11	10.0002	<0.2
		25	74	✓	58	0.001 103%	1.0
	Recalibration	X	X	X	X	X	
	Calib. Verification	75	100	200	83	0.31 103%	310

ICS and Calibration Verification: 283-2 True Value: 0.30 (ppm)
CROL: 0.2 (ppb)

Spike = 1.0 mL of 0.1 mg/L std. in final volume of 100 mL = 0.0010 mg/L spike

Comments:

Analyst Checked: JP Date: 6-19-86
Q.C. Approved: BT Date: 7/2/86

62-6021-6-0015

334
326
334
310

Accu-Labs Research, Inc.

F 7007 Rev. E

CYANIDE

Procedure No. 3807243
Wavelength: 578 nm
Water X Soil X Other X

B & L Spec No. 200012
Date: 6-20-86 Time: 9:30 AM
Analyst: P. Shugart
I.D.L.: ()
Page 1 of 1

Date Prepared: 6-20-86

STANDARDS

Prepared by: P. Shugart

	Concentration (<u>ug</u> / <u>250ml</u>)	Initial Absorbance	Recalibration Absorbance	Average Absorbance
Calibration Blank	0	0.00	0.00	0.00
Standard 1	5.0	0.080	0.039	0.0395
Standard 2	10.0	0.084	0.080	0.082
Standard 3	25.0	0.214	0.215	0.2145
Standard 4	50.0	0.439	0.435	0.437
Standard 5	100.0	0.819	0.815	0.817

EPA No.	Sample Number	Aliquot	Dilution Factor	Absorbance	Concentration (ppb)	
	Initial Calib.	X	X	X	X	
	Calib. Verification	250	1.0	.219	104	104%
	Calib. Blank	250	1.0	0.00	<5.0	<10
	Reagent Blank	500	1.0	0.00	<5.0	<10
	LCS	250	1.0	.198	94.1	94
MFC 272	62-6021-2 -1	500ml	1.0	.001	25.0	<10
MFC 272	62-6021-2 -1R	250ml	1.0	.001	25.0	<10
MFC 274	62-6021-2 -2	500 ml	1.0	.000	<5.0	<10
MFC 274	62-6021-2 -2S	250 ml	1.0	.190	90%	90
	Calib. Verification	250	1.0	.217	101.9	103
	Calib. Blank	250	1.0	0.00	0.00	<10
	Recalibration	X	X	X	X	
	Calib. Verification					
	Calib. Blank					

Calibration Verification: 25 ug / 250ml
LCS: 25 ug / 250ml
CRDL: 10

True Value: 100.0 (ppb)
True Value: 100.0 (ppb)

Spike = 5.0 mL of 5.0 mg/L std. in final volume of 250 mL = 0.100 mg/L spike

Comments:

Analyst Checked: N Date: 6-20-86
Q.C. Approved: SLH Date: 7/2/86

62-6021-6-0016

Furnace

F 7001 Rev. A

EPA Total Metals Digestion Sheet
 Procedure Number 33072J0

Date 6-16-86 Time 9:00am
 Analyst JP

Sample Number	Initial Volume (ml)	Final Volume (ml)	Acid Added (ml)	Metals to be Run - ALL
Reagent Blank	100	100	HNO ₃ H ₂ O ₂	H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
CS				H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
62-6021 1				H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
IR				H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
2				H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
63-6043-1				H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
IR				H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
57-2014 1				H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
IR				H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn

007245

Spike Data:

ALR Number	Sample Volume (ml)	Standard Spike Used														Comments
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
62-6021 25								✓	✓							
63-6043 15								✓	✓							

Alkali Metals and Al/Ba Split Yes () No ()

Digestion Comments on Reverse Side.

EPA HGA Injection Log

Element: Sb

PE 5000 No. 82057 ✓

Analyst: _____

PE 603 No. 82034

Date: 7/2/86 Time: 12:15 pm

Date: 7/2/86 Time: 3:45 pm

1	std 3		1	Std 3
2	C-Verif		2	C-Verif
3	C-Blk ⁰		3	C-Blk ⁰
4	R-Blk ⁰		4	R-Blk ⁰
5	ACS		5	ACS
6	62-6021-1		6	63-6043-2
7	-1R		7	-2R
8	-2		8	-3
9	C-Verif		9	C-Verif
10	C-Blk ⁰		10	C-Blk ⁰
11	62-6021-2s		11	63-6043-4
12	63-6043-1		12	-5
13	-1R		13	-6
14	-2S		14	-7
15	recal std 3		15	-8
16	C-Verif		16	recal std 3
17	C-Blk ⁰		17	C-Verif
18			18	C-Blk ⁰
19			19	63-6043-8s
20			20	C-Verif
21			21	C-Blk ⁰
22			22	
23			23	
24			24	
25			25	
26			26	
27			27	
28			28	
29			29	
30			30	
31			31	
32			32	
33			33	
34			34	
35			35	

Comments:

62-6021-6-0023

007246

EPA HGA Injection Log

Element: lb. Anaspk PE 5000 No. 82067 PE 5000Z No. 82143

Analyst: JEH PE 603 No. 82034

Date: 7/3/86 Time: 8:00 am Date: _____ Time: _____

1	Std 3	1
2	C-Verif	2
3	C-Blk	3
4	ACS	4
5	62-6021-1	5
6	-1R	6
7	-2	7
8	63-6043-1	8
9	C-Blk	9
10	C-Verif	10
11	63-6043-1R	11
12	ACS	12
13	63-6043-2	13
14	-2R	14
15	-3	15
16	Recal std 3	16
17	C-Verif	17
18	C-Blk	18
19	63-6043-4	19
20	-5	20
21	-6	21
22	-7	22
23	-8	23
24	Recal std 3 C-Blk	24
25	C-Verif	25
26		26
27		27
28		28
29		29
30		30
31		31
32		32
33		33
34		34
35		35

Comments:

007247

EPA MCA Injection Log

Element: Pb

PE 5000 No. 82057 ✓

Analys: FeH

PE 603 No. 82034

Date: 6/27/86 Time: 9:00am

Date: 6/30/86 Time: 9:00am

1	std 3	# 1	std 3
2	C-Verif	# 2	C-Verif
3	C-Blk	# 3	C-Blk
4	R-Blk	# 4	R-Blk
5	LCS	# 5	LCS
6	62-6021-1	# 6	63-6043-2
7	-1R	# 7	-2R
8	-2	# 8	-3
9	C-Verif	# 9	C-Verif
10	C-Blk	# 10	C-Blk
11	62-6021-2s	# 11	63-6043-4
12	63-6043-1	# 12	-5
13	-1R	# 13	-6
14	-1s	# 14	-7
15	recal std 3	# 15	-8
16	C-Verif	# 16	recal std 3
17	C-Blk	# 17	C-Verif
18		# 18	C-Blk
19		# 19	63-6043-8s
20		# 20	C-Verif
21		# 21	C-Blk
22		# 22	
23		# 23	
24		# 24	
25		# 25	
26		# 26	
27		# 27	
28		# 28	
29		# 29	
30		# 30	
31		# 31	
32		# 32	
33		# 33	
34		# 34	
35		# 35	

Comments:

007248

EPA MGA Injection Log

Element: Pb - Anas spk

PE 5000 No. 82067

Analyst: Fott

PE 603 No. 82034

Date: 6/30/86 Time: 1:00 pm

Date: _____ Time: _____

1	stcl 3	1
2	C-Verf	2
3	C-Blk	3
4	XCS	4
5	62-6021-1	5
6	-1R	6
7	-2	7
8	63-6043-1	8
9	C-Blk	9
10	C-Verf	10
11	63-6043-1R	11
12	XCS	12
13	63-6043-2	13
14	-2R	14
15	-3	15
15	Retal stcl 3	16
17	C-Verf	17
18	C-Blk	18
19	63-6043-4	19
20	-5	20
21	-6	21
22	-7	22
23	-8	23
24	C-Blk	24
25	C-Verf	25
26		26
27		27
28		28
29		29
30		30
31		31
32		32
33		33
34		34
35		35

Comments:

007249

EPA HGA Injection Log

Element: Pb

PE 5000 No. 32057 ✓

Analyst: EH

PE 603 No. 32034

Date: 6/24/86 Time: 10:00am

Date: 6/29/86 Time: 8:00am

1	Std 3	1	Std 3
2	C-Verif	2	C-Verif
3	C-Blk	3	C-Blk
4	R-Blk	4	R-Blk
5	RCS	5	RCS
6	62-6021-1	6	63-6043-2
7	-1R	7	-2R
8	-2	8	-3
9	C-Verif -2	9	C-Verif
10	C-Blk	10	C-Blk
11	62-6021-2s	11	63-6043-4
12	63-6043-1	12	-5
13	-1R	13	-6
14	-1s	14	-7
15	recal std 3	15	-8
16	C-Verif	16	recal std 3
17	C-Blk	17	C-Verif
18		18	C-Blk
19		19	63-6043-8s
20		20	C-Verif
21		21	C-Blk
22		22	
23		23	
24		24	
25		25	
26		26	
27		27	
28		28	
29		29	
30		30	
31		31	
32		32	
33		33	
34		34	
35		35	

Comments:

007250

EPA HGA Injection Log

Element: Pb

PE 5000 No. 32067

Analysis: FA

PE 603 No. 32034

Date: 6/25/86 Time: 1:00 pm

Date: _____ Time: _____

1	slid 3	# 1
2	C-Verf	# 2
3	C-Blk	# 3
4	RCS	# 4
5	62-6021-1	# 5
6	-1R	# 6
7	-2	# 7
8	63-6043-1	# 8
9	C-Blk	# 9
10	C-Verf	# 10
11	63-6043-1R	# 11
12	RCS	# 12
13	63-6043-2	# 13
14	-2R	# 14
15	-3	# 15
16	recal steel	# 15
17	C-Verf	# 17
18	C-Blk	# 18
19	63-6043-4	# 19
20	-5	# 20
21	-6	# 21
22	-7	# 22
23	-8	# 23
24	C-Blk	# 24
25	C-Verf	# 25
26	63-6043-2	# 25
27	-2R	# 27
28	-3	# 28
29	-4	# 29
30	-7	# 30
31	recal steel 3	# 31
32	C-Verf	# 32
33	C-Blk	# 33
34		# 34
35		# 35

10x

Comments:

007251

EPA HGA Injection Log

Element: Se PE 5000 No. 82067 PE 5000Z No. 82143

Analyst: EJH PE 603 No. 82034

Date: 7/2/86 Time: 9:00am Date: 7/2/86 Time: 10:30am

1	std 3	1	std 3
2	C-Verif	2	C-Verif
3	C-Blk	3	C-Blk
4	R-Blk	4	R-Blk
5	LCS	5	LCS
6	62-6021-1	6	63-6043-2
7	-1R	7	-2R
8	-2	8	-3
9	C-Verif	9	C-Verif
10	C-Blk	10	C-Blk
11	62-6021-2s	11	63-6043-4
12	63-6043-1	12	-5
13	-1R	13	-6
14	-1s	14	-7
15	recal std 3	15	-8
16	C-Verif	16	recal std 3
17	C-Blk	17	C-Verif
18		18	C-Blk
19		19	63-6043-8s
20		20	C-Verif
21		21	C-Blk
22		22	
23		23	
24		24	
25		25	
26		26	
27		27	
28		28	
29		29	
30		30	
31		31	
32		32	
33		33	
34		34	
35		35	

Comments:

007252

EPA HGA Injection Log

Element: Se. Amalgam PE 5000 No. 82067 PE 5000Z No. 82143 ✓

Analyst: E.H. PE 603 No. 82034

Date: 7/2/86 Time: 1:05 pm Date: _____ Time: _____

1	stal 3	1
2	C-Verif	2
3	C-Blk	3
4	RCS	4
5	62-6021-1	5
6	-1R	6
7	-2	7
8	63-6043-1	8
9	C-Blk	9
10	C-Verif	10
11	63-6043-1R	11
12	RCS	12
13	63-6043-2	13
14	-2R	14
15	-3	15
16	recal stal 3	16
17	C-Verif	17
18	C-Blk	18
19	63-6043-4	19
20	-5	20
21	-6	21
22	-7	22
23	-8	23
24	C-Blk	24
25	C-Verif	25
26	63-6043-1 > 10x	26
27	-1R	27
28	recal stal	28
29	C-Verif	29
30	C-Blk	30
31		31
32		32
33		33
34		34
35		35

Comments:

007253

EPS MGA Injection Log

Element: TL

PE 5000 No. 82057

Analyst: EH

PE 603 No. 82034 ✓

Date: 6/30/86 Time: 8:00am

Date: 6/30/86 Time: 1:20 pm

1	std 3		1	std 3
2	C-Verif		2	C-Verif
3	C-Blk		3	C-Blk
4	R-Blk		4	R-Blk
5	XCS		5	XCS
6	62-6021-1		6	63-6043-2
7	-1R		7	-2R
8	-2		8	-3
9	C-Verif		9	C-Verif
10	C-Blk		10	C-Blk
11	62-6021-2s		11	63-6043-4
12	63-6043-1		12	-5
13	-1R		13	-6
14	-1s		14	-7
15	recal std 3		15	-8
16	C-Verif		16	recal std 3
17	C-Blk		17	C-Verif
18			18	C-Blk
19			19	63-6043-8s
20			20	C-Verif
21			21	C-Blk
22			22	
23			23	
24			24	
25			25	
26			26	
27			27	
28			28	
29			29	
30			30	
31			31	
32			32	
33			33	
34			34	
35			35	

Comments:

007254

EPA HGA Injection Log

Element: Pl - Anal spk

PE 5000 No. 82057

Analysis: LoH

PE 603 No. 82034

Date: 7/1/86 Time: 8:00am

Date: _____ Time: _____

1	stcl 3	1
2	C-Verif	2
3	C-Blk	3
4	RCS	4
5	62-6021-1	5
6	-1R	6
7	-2	7
8	63-6043-1	8
9	C-Blk	9
10	C-Verif	10
11	63-6043-1R	11
12	RCS	12
13	63-6043-2	13
14	-2R	14
15	-3	15
16	Recal stcl 3	16
17	C-Verif	17
18	C-Blk	18
19	63-6043-4	19
20	-5	20
21	-6	21
22	-7	22
23	-8	23
24	C-Blk	24
25	C-Verif	25
26		26
27		27
28		28
29		29
30		30
31		31
32		32
33		33
34		34
35		35

Comments:

007255

EPA HGA Injection Log

Element: Sn

PE 5000 No. 32057

Analyst: _____

PE 603 No. 32034

Date: 7/2/86 Time: 9:30am

Date: 7/2/86 Time: 1:25pm

1	Std 3		1	Std 3
2	C-Verif		2	C-Verif
3	C-Blk		3	C-Blk
4	R-Blk		4	R-Blk
5	HCS		5	HCS
6	62-6021-1		6	63-6043-2
7	-1R		7	-2R
8	-2R		8	-3
9	C-Verif		9	C-Verif
10	C-Blk		10	C-Blk
11	62-6021-2s		11	63-6043-4
12	63-6043-1		12	-5
13	-1R		13	-6
14	-1s		14	-7
15	recal std 3		15	-8
16	C-Verif		16	recal std 3
17	C-Blk		17	C-Verif
18			18	C-Blk
19			19	63-6043-8s
20			20	C-Verif
21			21	C-Blk
22			22	
23			23	
24			24	
25			25	
26			26	
27			27	
28			28	
29			29	
30			30	
31			31	
32			32	
33			33	
34			34	
35			35	

Comments:

007256

EPA HGA Injection Log

Element: Sw - Ana spk PE 5000 No. 82067 PE 5000Z No. 82143

Analyst: EH PE 603 No. 82034

Date: 7/3/86 Time: 8:15am Date: _____ Time: _____

1	stcl 3	1
2	C-Verif	2
3	C-Bek ^D	3
4	RCS	4
5	62-6021-1	5
6	-1R	6
7	-2	7
8	63-6043-1	8
9	C-Bek	9
10	C-Verif	10
11	63-6043-1R	11
12	RCS	12
13	63-6043-2	13
14	-2R	14
15	-3	15
16	Recal stcl 3	16
17	C-Verif	17
18	C-Bek	18
19	63-6043-4	19
20	-5	20
21	-6	21
22	-7	22
23	-8	23
24	C-Bek	24
25	C-Verif	25
26	62-6021-1 -10x	26
27	-1R -10x	27
28		28
29		29
30		30
31		31
32		32
33		33
34		34
35		35

007257

Comments:

EPA HGA Injection Log

Element: V

PE 5000 No. 32057

Analyst: FH

PE 603 No. 32034 ✓

Date: 6/26/86 Time: 9:00am

Date: 6/26/86 Time: 12:45 pm

1	std 3		1	std 3
2	C-Verif		2	C-Verif
3	C-Bek		3	C-Bek
4	R-Bek		4	R-Bek
5	LCS		5	LCS
6	62-6021-1		6	63-6043-2
7	-1R		7	-2R
8	-2		8	-3
9	C-Verif		9	C-Verif
10	C-Bek		10	C-Bek
11	62-6021-2s		11	63-6043-4
12	63-6043-1		12	-5
13	-1R		13	-6
14	-1s		14	-7
15	recal std 3		15	-8
16	C-Verif		16	recal std 3
17	C-Bek		17	C-Verif
18			18	C-Bek
19			19	63-6043-8s
20			20	C-Verif
21			21	C-Bek
22			22	
23			23	
24			24	
25			25	
26			26	
27			27	
28			28	
29			29	
30			30	
31			31	
32			32	
33			33	
34			34	
35			35	

Comments:

007258

Accu-Labs Research, Inc.

F 7014 Rev. C

EPA HGA Injection Log

Element: V-Analyte

PE 5000 No. 82067

Analyst: FJA

PE 603 No. 82034

Date: 6/26/86 Time: 2:15 pm

Date: _____ Time: _____

1	Std 3				1
2	C-Verf				2
3	C-Blk				3
4	RCS				4
5	62-6021-1				5
6		-1R			6
7		-2	-2x		7
8	63-6043-1				8
9	C-Blk				9
10	C-Verf				10
11	63-6043-1R				11
12	RCS				12
13	62-6043-2		-2x		13
14		-2R	-2x		14
15		-3	-2x		15
16	Recal Std 3				16
17	C-Verf				17
18	C-Blk				18
19	63-6043-4		-2x		19
20		-5	-2x		20
21		-6	-2x		21
22		-7	-2x		22
23		-8	-2x		23
24	C-Blk				24
25	C-Verf				25
26					26
27					27
28					28
29					29
30					30
31					31
32					32
33					33
34					34
35					35

Comments:

007259

Internal Chain of Custody
Original Sample

Case Number 6021

ALR Number 62-6021-2

Log-in date 6-6-86 Location 3

Log-in time 8:30 Sample Type H₂O

Sample Custodian CH Preservation and Volume 2-L NaOH

Comments:

007260

Date	Time Out	Time In	Analysis Performed	Analyst	Comments
6-13-86	10:35	10:46AM	CN	AD	
6-18-86	9:10	9:30	CN	AD	
6-19-86	10:50AM		90 Solids	AD	AD

FLAME

F 7001 Rev. A

EPA Total Metals Digestion Sheet
 Procedure Number 3307200

Date 6-16-86 Time 9:00 am
 Analyst JP

Sample Number	Initial Volume (ml)	Final Volume (ml)	Acid Added (ml)	Metals to be Run <u>ALL</u>
Reagent Blank	100	100	HNO ₃ HCl	H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
CS	1	1	1	H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
62-6021-1	1	1	1	H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
IR				H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
2	1	1	1	H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
63-6043 1	1	1	1	H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
IR				H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
57-2014 1	1	1	1	H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn
IR	↓	↓	↓	H.M., Group I & II, Pb/Ag, Al/Ba, V, As/Se, Be, Sb, Tl, Sn

007262

Spike Data:

ALR Number	Sample Volume (mL)	Standard Spike Used														Comments
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
62-6021-25	100	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓		
63-6043-15	100	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓		

Alkali Metals and Al/Ba Split Yes (✓) No ()

Digestion Comments on Reverse Side.

62-6021-6-0018

Water - Flame Digestion Spikes

	<u>Element</u>	<u>Spk. Sol. Conc. (ppm)</u>	<u>Spike Vol. (ml)</u>	<u>Final Vol. (ml)</u>	<u>Spike Conc. (ppm)</u>
Std. 1	Cr	20	1.0	100	0.200
	Cu	25			0.250
	Pb	50			0.500
	Co	50			0.500
	Fe	100			1.0
Std. 2	Zn	100	0.2	100	0.200
	Mn	100			0.200
Std. 3	Ni	100	0.4	100	0.400
Std. 4	Be	50	0.1	100	0.050
Std. 5	Sn*	100	0.2	100	0.200
	Sb*	25			0.050
Std. 6	Cd	50	0.10	100	0.050
	Ag	50			0.050
Std. 9	Na	1000	10	100	100
Std. 10	Ca	1000	10	100	100
Std. 11	K	1000	5	100	50
Std. 12	Mg	1000	5	100	50
Std. 13	Al	1000	0.2	100	2.0
Std. 14	Ba	1000	0.2	100	2.0

Water - Furnace Digestion Spikes

	<u>Element</u>	<u>Spk. Sol. Conc. (ppm)</u>	<u>Spike Vol. (ml)</u>	<u>Final Vol. (ml)</u>	<u>Spike Conc. (ppm)</u>
Std. 7	As	20	0.1	100	0.020
	Pb	20			0.020
Std. 8	Tl	50	0.1	100	0.050
	Cd	5			0.005
	Se	10			0.010
	V	50			0.050

* HCl/HNO₃ digestion analyzed by furnace atomic absorption.WRITTEN E.L. DATE 2-5-86 QA TJB DATE 2-6-86APPROVED CCPAGE 5 OF 7

Ab
7/2/86
3:15 pm
E.H.

0.327
 0.327
 0.327 AV
 0.000 AZ
 0.128
 0.127
 0.128 AV
 0.050 S1
 0.095 C
 0.097 C
 0.096 AV
 0.100 S2
 0.065
 0.065 ~~STU~~
 0.065 AV
 0.098
 0.099 CU
 0.098 AV
 -0.002
 -0.002 ~~CBIK~~
 -0.002 AV
 -0.003
 -0.003 ~~RBK~~
 -0.003 AV
 0.103
 0.105 ~~C~~ LCS
 0.104 AV
 -0.003
 -0.004 1
 -0.004 AV
 -0.004
 -0.004 IR
 -0.004 AV
 -0.005
 -0.005 2
 -0.005 AV
 0.106 C
 0.104 CU
 0.105 AV
 -0.005
 -0.005 ~~CBIK~~
 -0.005 AV
 0.026
 0.025 ~~2S~~
 0.026 AV
 -0.006
 -0.006 1
 -0.006 AV
 -0.006
 -0.007 IR
 -0.006 AV
 0.030
 0.031 1s
 0.031 AV

Ab cont

-0.006
 -0.006
 -0.006 AV
 0.000 AZ
 0.054
 0.054
 0.054 AV
 0.050 S1
 0.095 C
 0.095 C
 0.095 AV
 0.100 S2
 0.063
 0.064 ~~STU~~
 0.064 AV
 0.100
 0.097 CU
 0.098 AV
 -0.001
 -0.002 ~~CBIK~~
 -0.001 AV

Ab
7/2/86
3:15 pm
E.H.

0.310
 0.309
 0.310 AV
 0.000 AZ
 0.135
 0.135
 0.135 AV
 0.135 S1
 0.050 S1
 0.097 C
 0.097 C
 0.097 AV
 0.100 S2
 0.067
 0.065 ~~STU~~
 0.066 AV
 0.099
 0.100 CU
 0.099 AV
 -0.001
 -0.001 ~~CBIK~~
 -0.001 AV
 -0.001
 -0.001 ~~RBK~~
 -0.001 AV
 0.100
 0.102 ~~LCS~~
 0.101 AV
 -0.002
 -0.001 2
 -0.002 AV
 -0.001
 -0.002 2R
 -0.002 AV
 -0.002
 -0.002 3
 -0.002 AV
 0.101
 0.103 CU
 0.102 AV
 -0.002
 -0.002 ~~CBIK~~
 -0.002 AV
 -0.003
 -0.002 4
 -0.003 AV
 -0.003
 -0.002 5
 -0.002 AV
 -0.003
 -0.002 6
 -0.002 AV
 -0.003
 -0.003 7
 -0.002 AV
 -0.003 8
 -0.003 AV

007264

7/2/86
Sb-conv
CST

-0.003
 -0.002
 -0.002 AV
 0.000 AZ
 0.055
 0.054
 0.055 AV
 0.050 SI
 0.093 C
 0.093 C
 0.093 AV
 0.100 S2
 0.068
 0.069 STD
 0.069 AV
 0.099
 0.097 CU
 0.098 AV
 -0.001
 -0.001 CBIK
 -0.001 AV
 0.006
 0.007 8S
 0.006 AV
 0.098
 0.098 CU
 0.098 AV
 -0.001
 -0.001 CBIK
 -0.001 AV

7/3/86
Sb
Ana 4pk
8:00 am
CST

0.343
 0.342
 0.343 AV
 0.000 AZ
 0.114
 0.113
 0.114 AV
 0.050 SI
 0.102 C
 0.100 C
 0.101 AV
 0.100 S2
 0.069
 0.067 STD
 0.068 AV
 0.101
 0.100 CU
 0.101 AV
 -0.001
 -0.002 CBIK
 -0.002 AV
 0.107 C
 0.110 CUS
 0.108 AV
 0.064
 0.064 1
 0.064 AV
 0.065
 0.063 1R
 0.064 AV
 0.070
 0.068 2
 0.069 AV
 0.046
 0.044 1
 0.045 AV
 -0.003
 -0.005 CBIK
 -0.004 AV
 0.100
 0.099 CU
 0.099 AV
 0.042
 0.044 1R
 0.043 AV
 0.105 C
 0.107 CUS
 0.106 AV
 0.058
 0.058 2
 0.058 AV
 0.058
 0.057 2R
 0.058 AV
 0.051
 0.052 3
 0.051 AV

7/3/86
Sb
Ana 4pk
CST

-0.006
 -0.007
 -0.006 AV
 0.000 AZ
 0.054
 0.054
 0.054 AV
 0.050 SI
 0.098 C
 0.096 C
 0.097 AV
 0.100 S2
 0.063
 0.066 STD
 0.065 AV
 0.097
 0.097 CU
 0.097 AV
 -0.001
 -0.002 CBIK
 -0.002 AV
 0.051 4
 0.054
 0.053 AV
 0.049
 0.048 5
 0.049 AV
 0.053
 0.052 6
 0.052 AV
 0.052 7
 0.052 AV
 0.055
 0.054 8
 0.054 AV
 -0.003
 -0.004 CBIK
 -0.003 AV
 0.098
 0.098 CU
 0.098 AV

007265

Raw
6/30/86
EA

-0.002
 -0.002
 -0.002 AV
 0.000 AZ
 0.056
 0.055
 0.056 AV
 0.050 S1
 0.098 C
 0.099 C
 0.098 AV
 0.100 S2
 0.073
 0.070
 0.071 AV
 0.027
 0.027 CU
 0.027 AV
 -0.000
 -0.001 CBK
 -0.000 AV
 0.054 8S
 0.055 AV
 0.026
 0.026 CU
 0.026 AV
 -0.000
 -0.001 CBK
 -0.001 AV

Raw
Onaxpk
6/30/86
EA

0.535
 0.533
 0.534 AV
 0.000 AZ
 0.271
 0.255
 0.263 AV
 0.050 S1
 0.097 C
 0.098 C
 0.098 AV
 0.100 S2
 0.069
 0.070
 0.070 AV
 0.026
 0.026 CU
 0.026 AV
 -0.000
 -0.000 CBK
 -0.000 AV
 0.041
 0.041
 0.041 AV
 0.025
 0.025
 0.025 AV
 0.027 IR
 0.026 IR
 0.026 AV
 0.021
 0.021 2
 0.021 AV
 0.018
 0.017
 0.018 AV
 -0.000
 -0.000 CBK
 -0.000 AV
 0.025
 0.026 CU
 0.026 AV
 0.018 IR
 0.018 IR
 0.018 AV
 0.044
 0.040
 0.042 AV
 0.032
 0.033 2
 0.033 AV
 0.038
 0.039 IR
 0.039 AV
 0.035
 0.034 3
 0.034 AV

Raw
Onaxpk
6/30/86
EA

0.000
 0.000
 0.000 AV
 0.000 AZ
 0.049
 0.049
 0.049 AV
 0.050 S1
 0.099 C
 0.097 C
 0.098 AV
 0.100 S2
 0.071
 0.069
 0.070
 0.025
 0.026 CU
 0.025 AV
 -0.001
 -0.001 CBK
 -0.001 AV
 0.030
 0.029 4
 0.030 AV
 0.031
 0.029 5
 0.030 AV
 0.031
 0.030 6
 0.031 AV
 0.046
 0.045 7
 0.045 AV
 0.041
 0.038 8
 0.040 AV
 -0.001
 -0.001 CBK
 -0.001 AV
 0.025
 0.026 CU
 0.025 AV

007266

AVG 0.021 0.018

COMBINATION
COUNT 12 00

Qd
6/27/86
9:00 am
E.H.

0.295
 0.295
 0.295 AV
 0.000 AZ
 0.216
 0.214
 0.215 AV
 0.050 S1
 0.099 C
 0.099 C
 0.099 AV
 0.100 S2
 0.071
 0.072 *sl*
 0.072 AV
 0.027
 0.027 CU
 0.027 AV
 -0.000
 0.000 *CBIK*
 0.000 AV
 0.000
 0.000 *RBIC*
 0.000 AV
 -0.022
 0.025 *LCS*
 0.024 AV
 0.006
 0.007 |
 0.006 AV
 0.007
 0.007 *IR*
 0.007 AV
 0.001
 0.002 2
 0.002 AV
 0.026
 0.025 CU
 0.025 AV
 -0.000
 -0.000 *CBIK*
 -0.000 AV
 0.017
 0.015 25
 0.016 AV
 0.000
 -0.000 |
 0.000 AV
 0.000
 0.000 *IR*
 0.000 AV
 0.014
 0.011 *IS*
 0.012 AV

62-6021

63-6043

0.285
 0.285
 0.285 AV
 0.000 AZ
 0.172
 0.169
 0.170 AV
 0.050 S1
 0.104 C
 0.104 C
 0.104 AV
 0.100 S2
 0.075 *sl*
 0.074
 0.074 AV
 0.025
 0.025 CU
 0.025 AV
 0.000
 -0.000 *CBIK*
 0.000 AV

Qd
6/30/86
9:00 am
E.H.

0.542
 0.543
 0.543 AV
 0.000 AZ
 0.215
 0.219
 0.217 AV
 0.050 S1
 0.098 C
 0.101 C
 0.099 AV
 0.100 S2
 0.072
 0.072 *sl*
 0.072 AV
 0.028
 0.027 CU
 0.027 AV
 -0.000
 0.000 *CBIK*
 0.000 AV
 -0.000
 -0.000 *RBIC*
 -0.000 AV
 0.022
 0.023 *LCS*
 0.023 AV
 0.017
 0.016 2
 0.016 AV
 0.022
 0.021 *sl*
 0.022 AV
 0.011
 0.011 3
 0.011 AV
 0.028
 0.029 CU
 0.028 AV
 0.000 *CBIK*
 -0.000
 0.000 AV
 0.007 4
 0.007
 0.007 AV
 0.010
 0.011 5
 0.010 AV
 0.009
 0.009 6
 0.009 AV
 0.028
 0.028 7
 0.028 AV
 0.022
 0.022 8
 0.022 AV

007267

pb
6/24/86
10:00am
E H

0.218
 0.216
 0.217 AV
 0.000 AZ
 0.215
 0.220
 0.213 AV
 0.050 S1
 0.091 C
 0.088 C
 0.089 AV
 0.100 S2
 0.070
 0.070 *stel*
0.070 AV
 0.040
 0.037 CU
0.039 AV
 0.001
 0.000 CBK
0.000 AV
 0.003
 0.003 RBK
 0.003 AV
0.037
 0.038 *LCS*
0.038 AV
 0.002
 0.002 1
0.002 AV
 0.002
 0.003 1R
0.002 AV
 0.008
 0.008 2
0.008 AV
 0.041
 0.038 CU
0.039 AV
 -0.002
 -0.001 CBK
-0.002 AV
 0.028
 0.029 2S
0.029 AV
 -0.002
 -0.001 1
-0.002 AV
 -0.001
 -0.001 1R
-0.001 AV
 0.023
 0.022 1S
0.023 AV

62-6021

63-6043

-0.000
 -0.000
 -0.000 AV
 0.000 AZ
 0.049
 0.048
 0.048 AV
 0.050 S1
 0.094 C
 0.095 C
 0.095 AV
 0.100 S2
 0.071
 0.072 *stel*
0.072 AV
 0.040
 0.041 CU
0.041 AV
 -0.000
 -0.000 CBK
 -0.000 AV

pb
6/25/86
8:00am
E H

0.239
 0.239
 0.239 AV
 0.000 AZ
 0.252
 0.251
 0.251 AV
 0.050 S1
 0.094 C
 0.094 C
 0.094 AV
 0.100 S2
 0.070
 0.069 *sto*
0.069 AV
 0.041
 0.041 CU
0.041 AV
 0.000
 0.000 CBK
0.000 AV
 -0.000
 -0.000 RBK
-0.000 AV
 0.039
 0.039 *LCS*
0.039 AV
 0.072
 0.072 2
0.072 AV
 0.058
 0.058 2R
0.058 AV
 0.070
 0.069 3
0.069 AV
 0.042
 0.042 CU
0.042 AV
 0.000
 0.000 CBK
0.000 AV
 0.060
 0.058 4
0.059 AV
 0.036
 0.035 5
0.036 AV
 0.012
 0.012 6
0.012 AV
 0.036
 0.037 7
0.036 AV
 0.039
 0.039 8
0.039 AV

007268

Pb
6/25/36

0.001
0.001
0.001 AV
0.000 AZ
0.052
0.051
0.051 AV
0.050 S1
0.091 C
0.093 C
0.092 AV
0.100 S2
0.069
0.068 S+D
0.068 AV
0.040
0.040 CV
0.040 AV
0.000
-0.000 CBK
-0.000 AV
0.068
0.067 8S
0.068 AV
0.040
0.040 CV
0.040 AV
0.000
-0.000 CBK
0.000 AV

007269

Pb
Anaspl
blastoc
1.00 Pm
Elt

0.245
0.245
0.245 AV
0.000 AZ
0.249
0.254
0.251 AV
0.050 S1
0.094 C
0.093 C
0.093 AV
0.100 S2
0.071
0.068 *std*
0.070 AV
0.040
0.040 CU
0.040 AV
0.000
-0.000 *CBIK*
0.000 AV
0.049
0.049 *LCS*
0.049 AV
0.012
0.012 1
0.012 AV
0.012
0.012 1R
0.012 AV
0.017
0.018 2
0.018 AV
0.009
0.009 1
0.009 AV
-0.000
-0.000 *CBIK*
-0.000 AV
0.040
0.040 CU
0.040 AV
0.008
0.008 1R
0.008 AV
0.050
0.050 *LCS*
0.050 AV
0.074
0.074 2
0.074 AV
0.063
0.062 2R
0.062 AV
0.073
0.071 3
0.072 AV

Pb. ans
cont
of k

0.000
0.000
0.000 AV
0.000 AZ
0.050
0.050
0.050 AV
0.050 S1
0.094 C
0.092 C
0.093 AV
0.100 S2
0.068
0.069 *std*
0.069 AV
0.040
0.039 CU
0.040 AV
-0.000
-0.000 *CBIK*
-0.000 AV
0.062
0.062 4
0.062 AV
0.039
0.051 5
0.045 AV
0.021
0.021 6
0.021 AV
0.040
0.038 7
0.039 AV
0.050
0.050 8
0.050 AV
-0.000
-0.000 *CBIK*
-0.000 AV
0.040
0.040 CU
0.040 AV

0.017
0.017 2
0.017 AV
0.016
0.015 2
0.015 AV
0.016
0.016 3
0.016 AV
0.017
0.017 4
0.017 AV
0.015
0.015 7
0.015 AV
0.001
0.000
0.000 AV
0.000 AZ
0.056
0.056
0.056 AV
0.050 S1
0.097 C
0.097 C
0.097 AV
0.100 S2
0.072
0.066 *std*
0.069 AV
0.040
0.041 CU
0.041 AV
0.002
0.002 *CBIK*
0.002 AV

007270

62 -
6021

63
6083

EA 7/2/86
9:00am

-0.078
 -0.079
 -0.079 AU
 0.000 AZ
 0.149
 0.153
 0.151 AU
 0.050 S1
 0.097 C
 0.098 C
 0.098 AU
 0.100 S2
 0.071
 0.072 *std*
 0.071 AU
 0.045
 0.045 CU
 0.045 AU
 0.000
 0.000 CBIK
 0.000 AU
 0.000
 0.000 RBIK
 0.000 AU
 0.040
 0.041 LCS
 0.040 AU
 0.001
 0.001 1
 0.001 AU
 0.000
 0.001 1R
 0.001 AU
 0.001
 0.000 2
 0.001 AU
 0.045
 0.045 CU
 0.045 AU
 0.001
 0.000 CBIK
 0.000 AU
 0.010
 0.010 2S
 0.010 AU
 0.000
 0.001 1
 0.001 AU
 0.000
 0.001 1R
 0.001 AU
 0.002
 0.003 1S
 0.003 AU

EA 7/2/86
cont

-0.000
 -0.000
 -0.000 AU
 0.000 AZ
 0.051
 0.051
 0.051 AU
 0.050 S1
 0.098 C
 0.098 C
 0.098 AU
 0.100 S2
 0.059
 0.070 *std*
 0.062 AU
 0.044
 0.045 CU
 0.045 AU
 0.001
 0.001 CBIK
 0.001 AU

EA 7/2/86
10:30am

-0.008
 -0.008
 -0.008 AU
 0.000 AZ
 0.147
 0.150
 0.148 AU
 0.050 S1
 0.104 C
 0.104 C
 0.104 AU
 0.100 S2
 0.074
 0.072 *std*
 0.073 AU
 0.047
 0.046 CU
 0.046 AU
 0.001
 -0.000 CBIK
 0.000 AU
 -0.000
 0.000 RBIK
 0.000 AU
 0.041
 0.041 LCS
 0.041 AU
 0.002
 0.002 2
 0.002 AU
 0.001
 0.002 *std*
 0.001 AU
 0.001
 0.001 3
 0.001 AU
 0.046
 0.046 CU
 0.046 AU
 0.001
 0.000 CBIK
 0.001 AU
 0.001
 0.001 4
 0.001 AU
 0.001
 0.001 5
 0.001 AU
 0.001
 0.001 6
 0.001 AU
 0.001
 0.001 7
 0.001 AU
 0.003
 0.002 }
 0.003 AU
 0.003 AU

007271

De. Cay

-0.001
-0.000
-0.000 AU
0.000 AZ
0.050
0.050
0.050 AU
0.050 S1
0.104 C
0.103 C
0.104 AU
0.100 S2
0.070
0.070 *std*
0.070 AU
0.047
0.046 CU
0.047 AU
0.001
-0.000 CBK
0.000 AU
0.010
0.010 85
0.010 AU
0.045
0.045 CU
0.045 AU
0.000
0.000 CBK
0.000 AU

007272

1.05 ~~EX~~ *AL* *YK*

-0.011
 -0.011
 -0.011 AU
 0.000 AZ
 0.153
 0.152
 0.152 AU
 0.050 S1
 0.104 C
 0.102 C
 0.103 AU
 0.100 S2
 0.070
 0.072 *st*
 0.071 AU
 0.045
 0.046 CU
 0.046 AU
 0.000
 -0.000 *CBIK*
 0.000 AU
 0.050
 0.051 *LCS*
 0.050 AU
 0.009
 0.008 *1*
 0.009 AU
 0.008
 0.008 *IR*
 0.008 AU
 0.008
 0.009 *2*
 0.008 AU
 0.003
 0.003 *IR*
 0.003 AU
 0.000
 -0.000 *CBIK*
 -0.000 AU
 0.045
 0.046 CU
 0.046 AU
 0.003
 0.003 *IR*
 0.003 AU
 0.050
 0.051 *LCS*
 0.050 AU
 0.010
 0.009 *2*
 0.010 AU
 0.010
 0.010 *2R*
 0.010 AU
 0.009
 0.010 *3*
 0.009 AU

0.000
 -0.000
 -0.000 AU
 0.000 AZ
 0.050
 0.051
 0.050 AU
 0.050 S1
 0.103 C
 0.103 C
 0.103 AU
 0.100 S2
 0.069
 0.070 *st*
 0.070 AU
 0.046
 0.046 CU
 0.046 AU
 0.001
 0.001 *CBIK*
 0.001 AU
 0.010
 0.010 *4*
 0.010 AU
 0.010
 0.010 *5*
 0.010 AU
 0.010
 0.010 *6*
 0.010 AU
 0.010
 0.010 *7*
 0.010 AU
 0.011
 0.011 *8*
 0.011 AU
 -0.000
 0.001 *CBIK*
 0.000 AU

0.045
 0.046 CU
 0.046 AU
 0.009
 0.009 *1*
 0.009 AU
 0.009
 0.009 *IR*
 0.009 AU
 0.001
 0.001
 0.001 AU
 0.000 AZ
 0.051
 0.052
 0.051 AU
 0.050 S1
 0.104 C
 0.103 C
 0.103 AU
 0.100 S2
 0.071
 0.070 *st*
 0.071 AU
 0.046
 0.046 *C*
 0.046 AU
 0.001
 0.000 *CBIK*
 0.001 AU

007273

TJL
6/30/86
8:00 am
F.H.

-0.027
-0.026
0.000
0.118
0.121
0.050 I
0.082 C
0.083 C
0.100 2
0.068
0.076 std
0.025 CU
0.026
-0.000
-0.000 CBIK
-0.001 RBIK
-0.000
0.028 LGS
0.026
-0.001
-0.001 1
-0.001 1R
-0.001
-0.000 2
-0.000
0.025 CU
0.026
-0.000 CBIK
-0.000
0.041 2s
0.040
-0.001 1
-0.001
-0.000 1R
-0.001
0.061 1s
0.062
-0.000
-0.000
0.000
0.053
0.053
0.050 I
0.084 C
0.060 C
0.100 I
0.073 std
0.070
0.026 CU
0.027
0.000
0.001 CBIK

62-6021

63-6043

TJL
6/30/86
1:20 pm
F.H.

0.003
0.003
0.000
0.119
0.126
0.050 I
0.005 C
0.061 C
0.100 E
0.074 std
0.069 std
0.025 CU
0.025
0.000 CBIK
0.000 RBIK
0.029 LGS
0.028
0.000 2
0.000 2R
0.000
0.000 3
0.001 CU
0.026 CBIK
0.001
0.001 4
0.001 5
0.001 6
0.001 7
0.001
0.002 8
0.002

TJL -cont
6/30/86
F.H.

-0.003
-0.003
0.000
0.054
0.049
0.050 I
0.085 C
0.085 C
0.100 E
0.071 std
0.072 std
0.025 CU
0.027 CU
-0.002 CBIK
-0.002 CBIK
0.045 8s
0.047 8s
0.026 CU
0.026
-0.000 CBIK
0.000 CBIK

007274

LAURENCE J. ...
...
...

97L Ana-SPK
6/30/86
8:00am
JH

0.005
0.005
0.000
0.127
0.120
0.050 I
0.077 C
0.082 C
0.100 E
0.065
0.071 Std
0.026 CV
0.026
0.002 CB1K
0.001
0.047
0.047 LCS
0.014 I
0.014
0.013
0.014 IR
0.013
0.014 2
0.021
0.021 I
0.002 CB1K
0.002
0.027 CV
0.027
0.020 IR
0.020
0.048 LCS
0.049
0.020
0.022 2
0.021 2R
0.022
0.020
0.020 3

62-6021

0.002
 0.002
 0.000
 0.050
 0.049
 0.050 I
 0.077 C
 0.077 C
 0.100 II
 0.069
0.071 Std
0.024
0.024 CV
-0.001
-0.001 CB1K
0.015
0.017 4
0.016
0.017 5
0.018
0.019 6
0.017 7
0.017
0.017 8
0.019
-0.001 CB1K
-0.001
0.025 CV
0.025

007275

ADW
7/2/86
9:30am
EXT

0.003
0.002
0.000
0.273
0.269
0.100 I
0.243 C
0.239 C
0.200 I
0.140
0.139 STD
0.048
0.049 CV
-0.001
0.001 CBIK
0.011 RBIK
-0.000
0.049 LCS
0.049
-0.001 1
-0.000 1
0.000
-0.013 IR
0.001
0.003 2
0.049 CV
0.045 CV
-0.002 CBIK
-0.003
~~0.004~~
0.130 2S
0.134 2S
0.007 1
0.005 1
-0.003 IR
-0.001 IR
0.038
0.034 IS
-0.004
-0.003
0.000
0.096
0.054
0.100 1
0.285 C
0.282 C
0.200 II
0.154
0.156 STD
0.060
0.059 CV
-0.002 CBIK
-0.003

ADW
7/2/86
1:25pm
EXT

-0.004
-0.005
0.000
0.242
0.213
0.100 I
0.284 C
0.261 C
0.200 I
0.153 STD
0.152 STD
0.056 CV
0.056 CV
-0.003 CBIK
-0.002 CBIK
0.026 RBIK
0.014 RBIK
0.054
0.055 LCS
0.001
0.004 2
0.003
0.005 2R
~~0.003~~
0.010 3
0.010
0.056 CV
0.054
-0.000 CBIK
-0.001 CBIK
0.011 4
0.005 4
0.006 5
0.003 5
0.004 6
0.005 6
0.007 7
0.006 7
0.001 8
0.001 8

ADW
7/2/86
cont

-0.001
-0.003
0.000
0.126 C
0.127 C
0.100 I
0.228 C
0.225 C
0.200 II
0.135 STD
0.136 STD
0.045 CV
0.045 CV
0.001 CBIK
0.001 CBIK
0.083 8S
0.080
0.047 CV
0.046 CV
0.002
-0.001 CBIK

007276

AW
 Ana sp K
 7/3/86
 8:15 am
 SW

0.591
 0.586
 0.000
 0.261
 0.217
 0.100 I
 0.190 C
 0.187 C
 0.200 L
 0.142
 0.141 sto
 0.049
 0.045 CV
 -0.003
 -0.003 CBIK
 0.132
 0.127 LCS
 0.017
 0.018 1
 0.016
 0.015 IR
 0.066
 0.079 2
 0.048 1
 0.046
 -0.005 CBIK
 -0.004
 0.053 CV
 0.048
 0.047 IR
 0.045
 0.125 LCS
 0.133
 0.054 2B
 0.057
 0.065 3R
 0.067
 0.070
 0.064 3

Sh
 ana sp K
 cont

-0.002
 -0.004
 0.000
 0.102
 0.094
 0.100 I
 0.199 C
 0.190 C
 0.200 E
 0.145
 0.152 sto
 0.055
 0.052 CV
 0.003
 0.003 CBIK
 0.061 4
 0.063
 0.067 5
 0.071
 0.087 6
 0.110
 0.066 7
 0.067
 0.076 8
 0.074
 0.003
 0.004 CBIK
 0.061 CV
 0.055

Sh
 ana sp K
 cont

0.055 1-10x
 0.060
 0.071 IR-10x
 0.072
 -0.002
 -0.009
 0.000
 0.100
 0.093
 0.100 I
 0.201 C
 0.201 C
 0.200 II
 0.148
 0.147 sto
 0.059
 0.053 CV
 0.001
 0.001 CBIK

007277

U
6/26/86
9.0000
EH

-0.002
 -0.010
 0.000
 0.098
 0.098
 0.050 I
 0.101 C
 0.103 C
 0.100 I
 0.075 Sto
 0.075 Sto
 0.067 CU
 0.066 CU
 0.002 CB1K
 -0.001 CB1K
 -0.003 RB1K
 -0.005
 0.059 LCS
 0.064 LCS
 0.003
 -0.001 I
 -0.003 IR
 -0.004 IR
 0.013
 0.012 2
 0.064 CU
 0.062 CU
 -0.001 CB1K
 -0.005 CB1K
 0.070 2S
 0.071
 -0.001 I
 -0.003
 -0.008 IR
 -0.009
 0.051 IS
 0.054
 0.002
 0.001
 0.000
 0.043
 0.049
 0.050 I
 0.100 C
 0.101 C
 0.100 II
 0.069
 0.075 Sto
 0.068
 0.062 CU
 -0.001 CB1K
 -0.000

62-6021

62-6043

U
6/26/86
12:45 PM
EH

-0.006
 -0.007
 0.000
 0.110
 0.114
 0.050 I
 0.092 C
 0.096 C
 0.100 I
 0.069
 0.073 Sto
 0.066 CU
 0.068 CU
 0.011
 0.003 CB1K
 0.001 RB1K
 0.000
 0.065 LCS
 0.064 LCS
 0.029
 0.022 2
 0.032 2R
 0.025 2R
 0.024
 0.026 3
 0.004 CU
 0.065
 0.007 CB1K
 0.004 CB1K
 0.020
 0.021 4
 0.027
 0.026 5
 0.025 6
 0.025 6
 0.043 7
 0.044 7
 0.039
 0.042 8

U-cont

0.002
 0.001
 0.000
 0.046
 0.047
 0.050 I
 0.098 C
 0.095 C
 0.100 II
 0.076 Sto
 0.071 Sto
 0.069 CU
 0.073 CU
 0.000 CB1K
 -0.001 CB1K
 0.064 8S
 0.071
 0.065 CU
 0.065 CB1K
 -0.000 CB1K
 -0.000

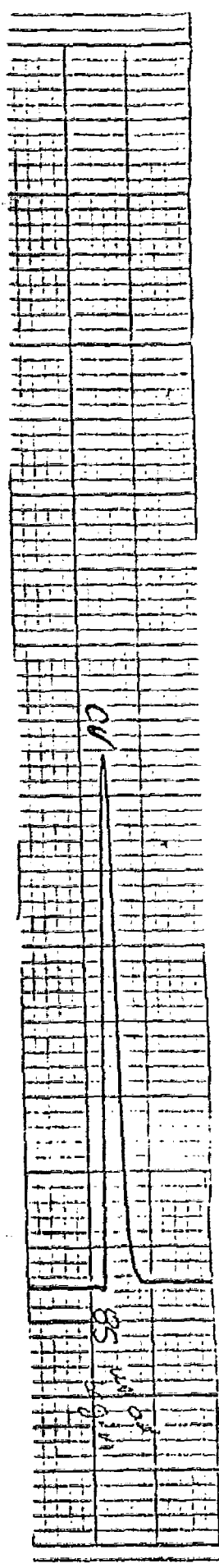
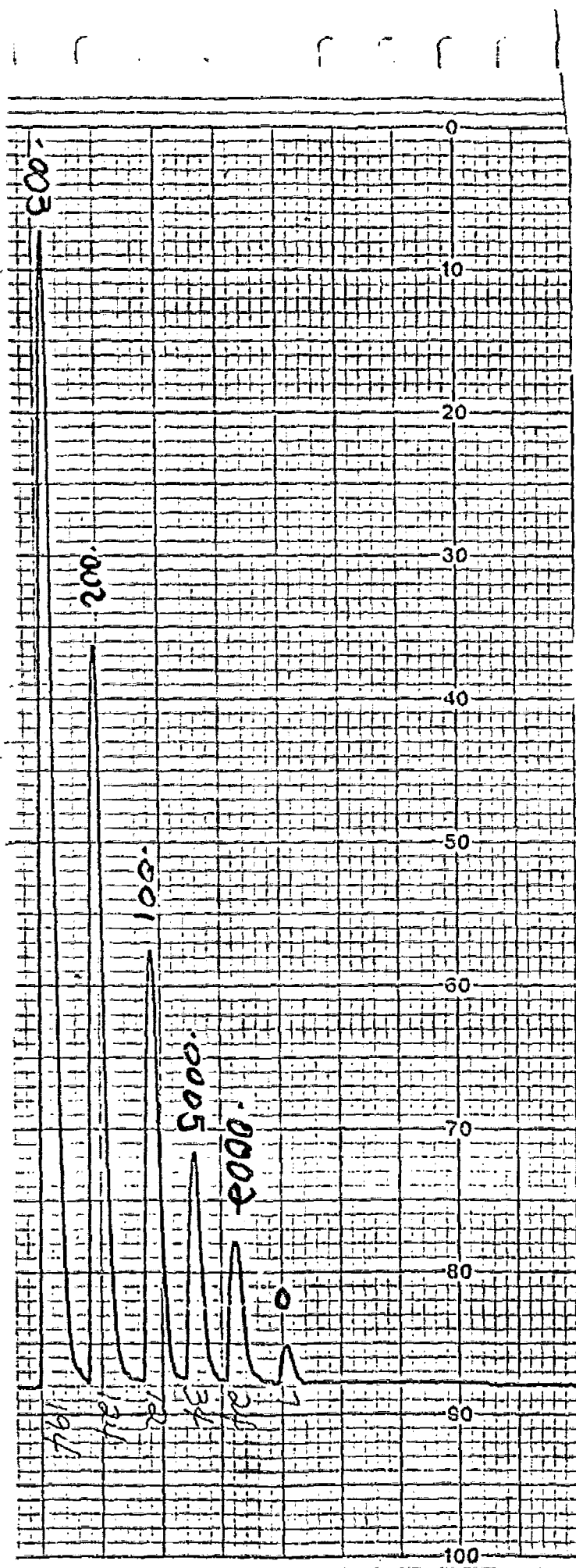
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V
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 EKH

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 C.001
 C.000
 C.118
 C.117
 C.050
 C.096 C
 C.097 C
 C.100
 C.073
 C.074 STD
 C.006
 C.067 CV
 C.002
 C.001 CBK
 C.113 C
 C.112 C
 C.101 1
 C.106 C
 C.100 IR
 C.064
 C.059 2
 C.098
 C.098 1
 C.063 CBK
 C.002
 C.066 CV
 C.069
 C.097 IR
 C.099
 C.117 C
 C.116 C
 C.063
 C.063 2
 C.062
 C.060 2R
 C.058
 C.057 3

C.004
 C.001
 C.000
 C.052
 C.054
 C.050 1
 C.087 C
 C.088 CH
 C.071 STD
 C.071
 C.063 CV
 C.065
 C.001 CBK
 C.001
 C.058 4
 C.057
 C.051 5
 C.050
 C.049 6
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 C.065 7
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 C.059
 C.001 CBK
 C.001
 C.060 W
 C.060

007279

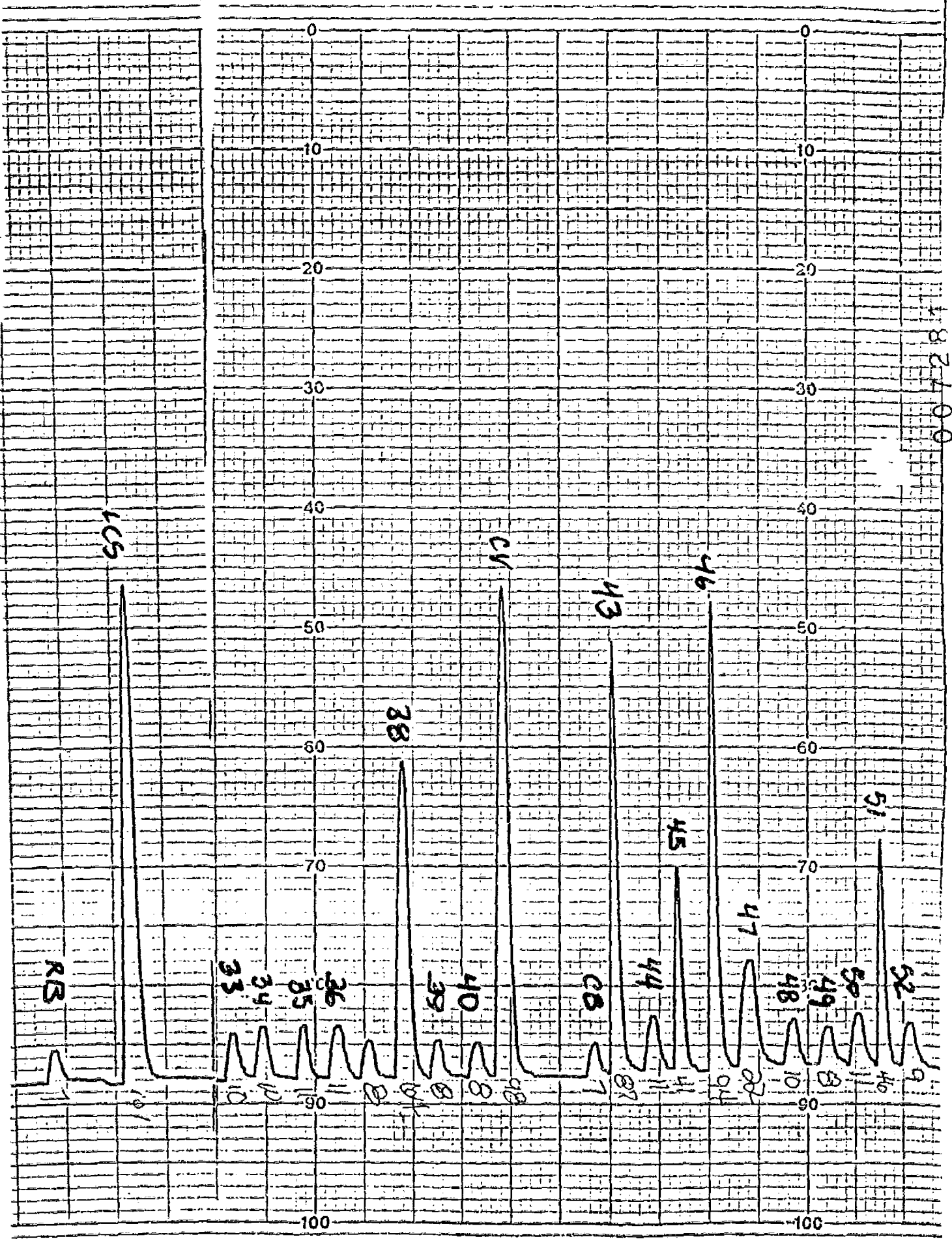


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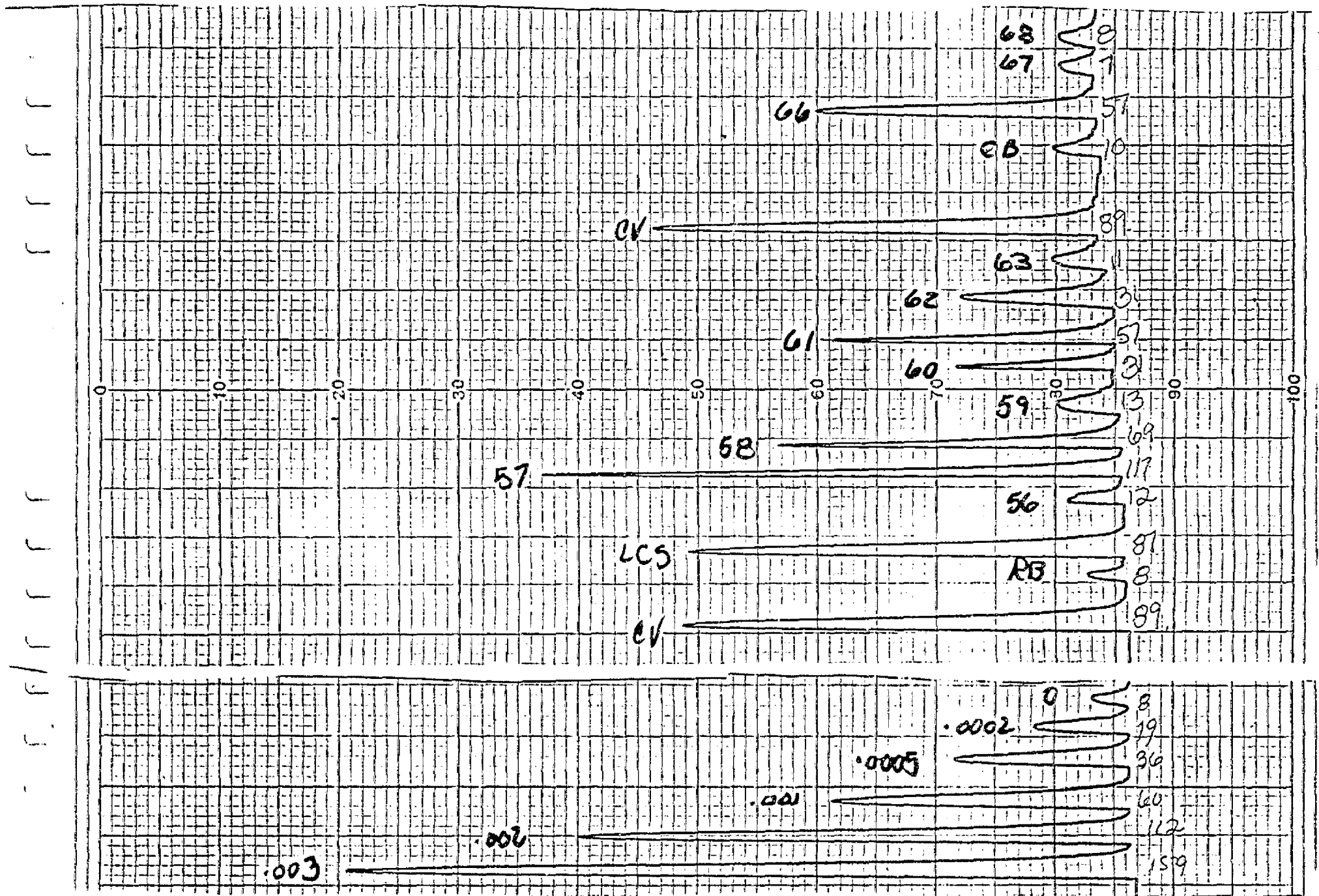
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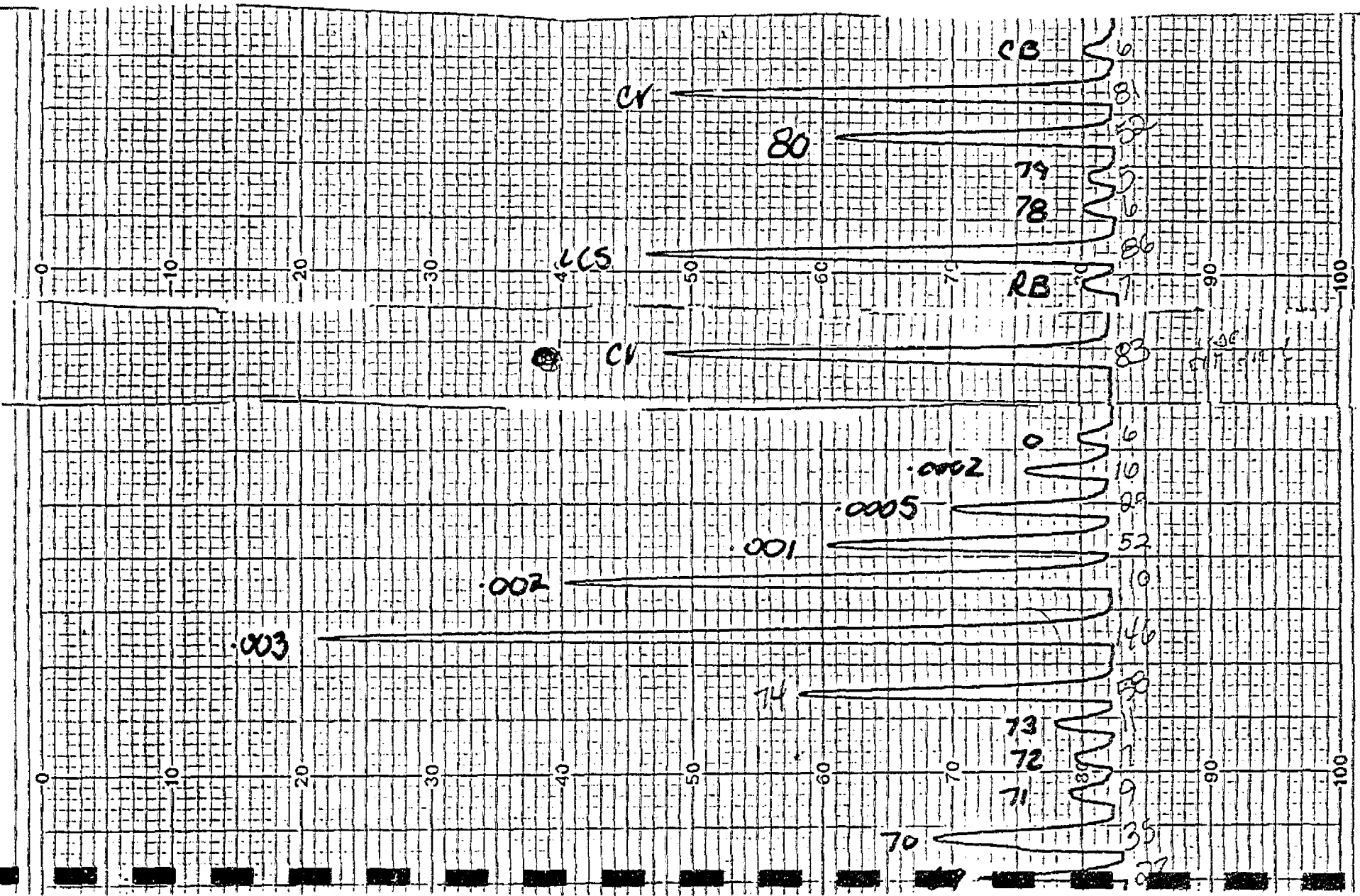


3

007282



H



QUALITY CONTROL SAMPLES

- 1) NBS 1643b
- 2) Trace Metal 3 - WP581
- 3) Trace Metal 3 - WP475
- 4) Minerals 2 - WP882
- 5) EP Extract Metals - WP283
- 6) Trace Metal 2 - WP481
- 7) Municipal Digested Sludge - 976
- 8) Trace Metal III - WP581
- 9) Tin Standard; 1000 ppm - American Scientific Products
- 10) EP Extract Metals 3 - WP 283 at 10 dilution
- 11) Trace Metals 1 - WP 284 - I
- 12) Trace Metals 2 - WP 284 - I
- 13) Trace Metals 2 - WP 1183-2
- 14) Trace Metals - WP 378-13
- 15) Minerals 384-2

007284

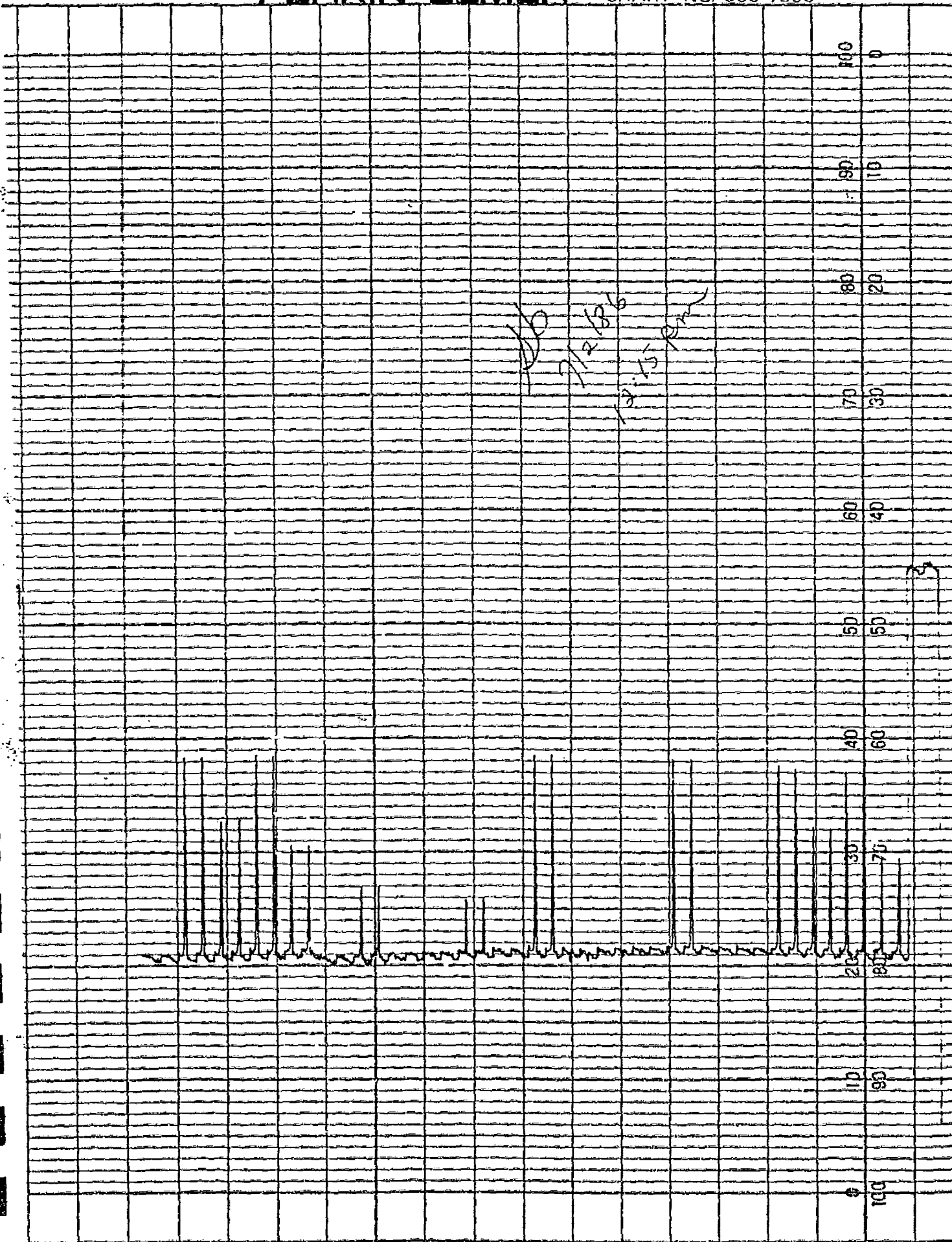
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PAGE 1 OF 1

PERKIN-ELMER

CHART NO. 056-7300



1007285

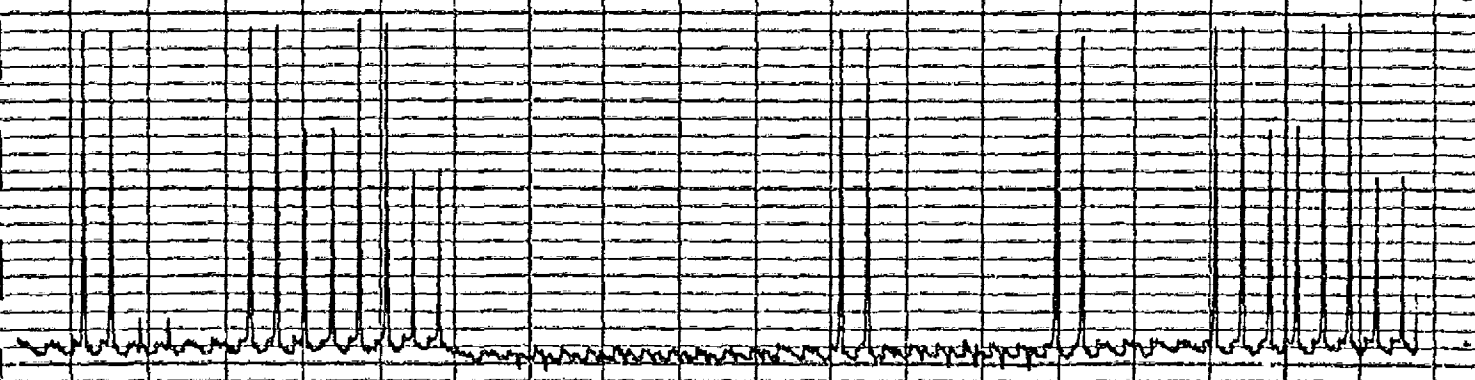
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PERKIN-ELM

1582

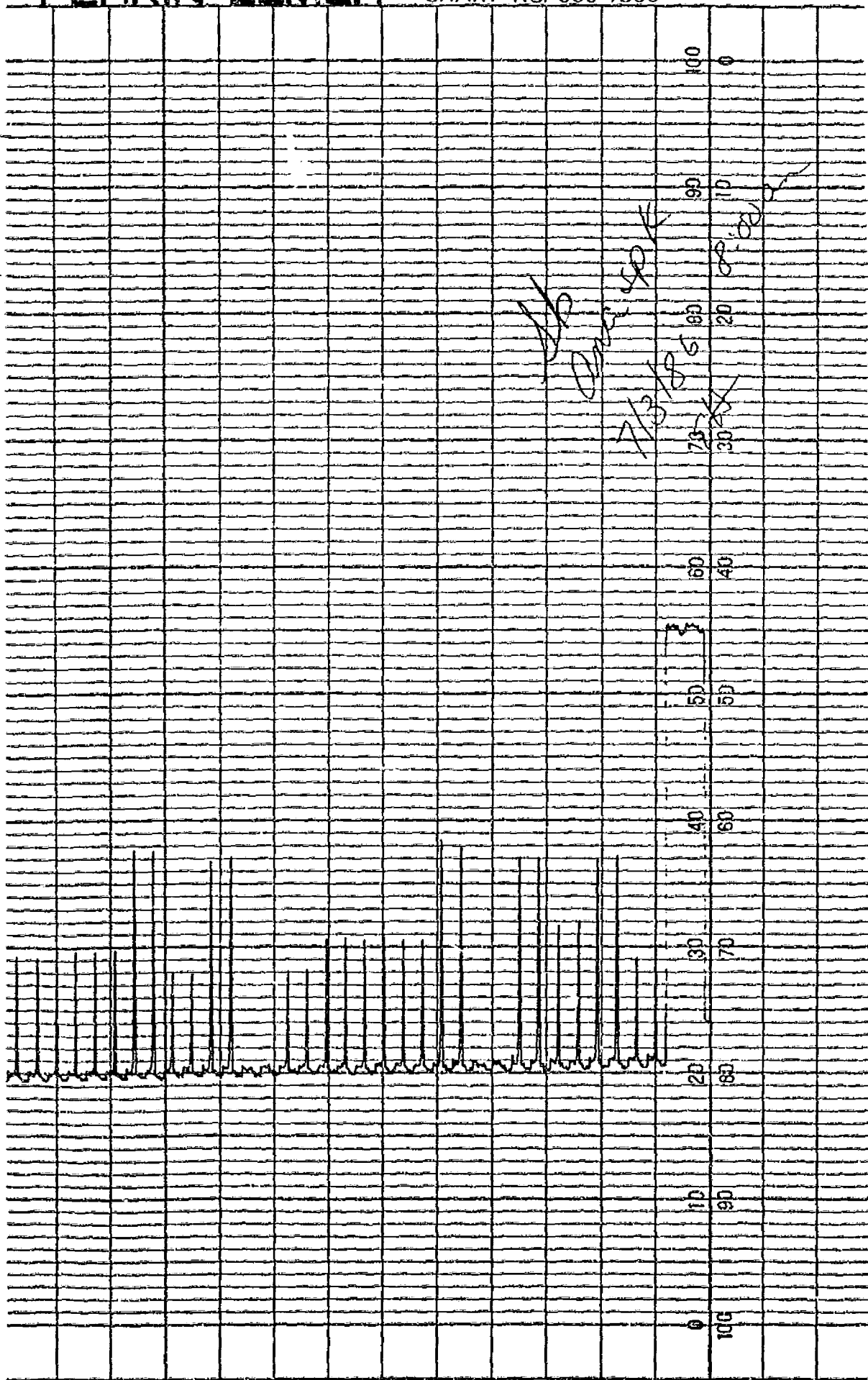
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1/18

007286

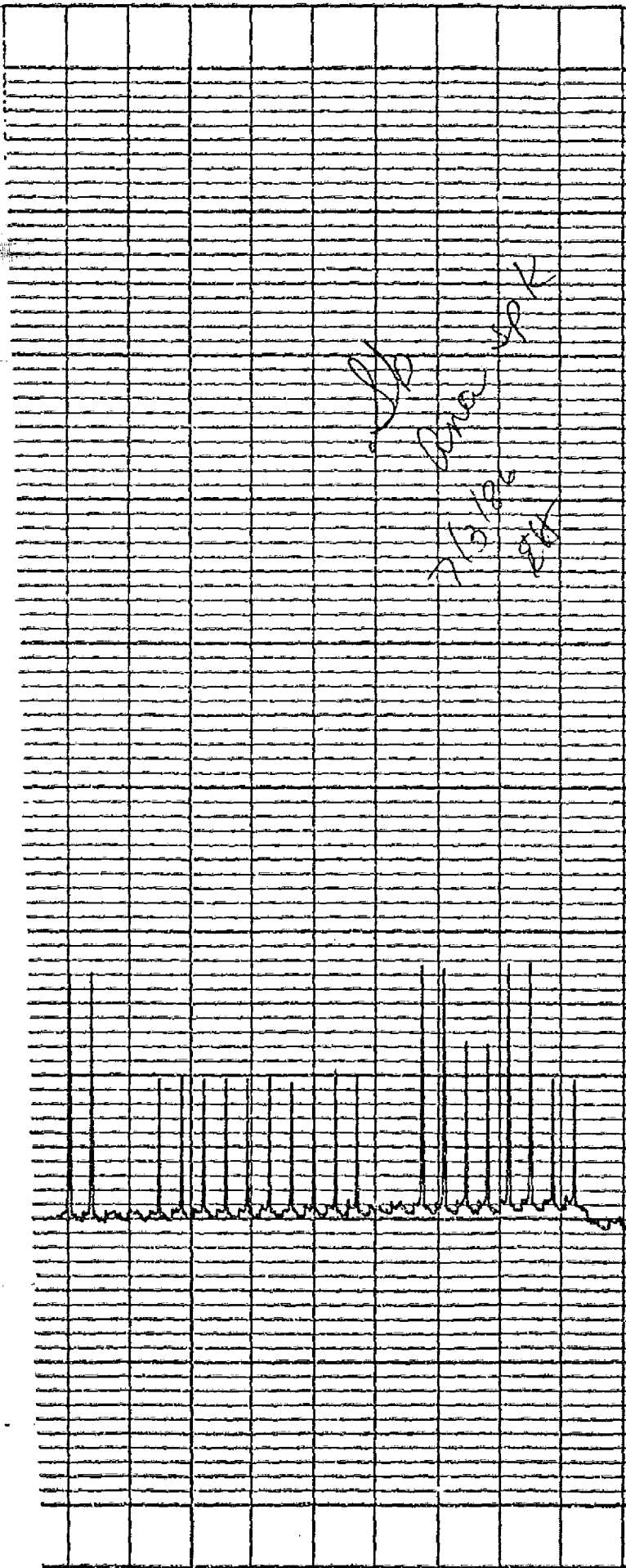


PERKIN-ELMER

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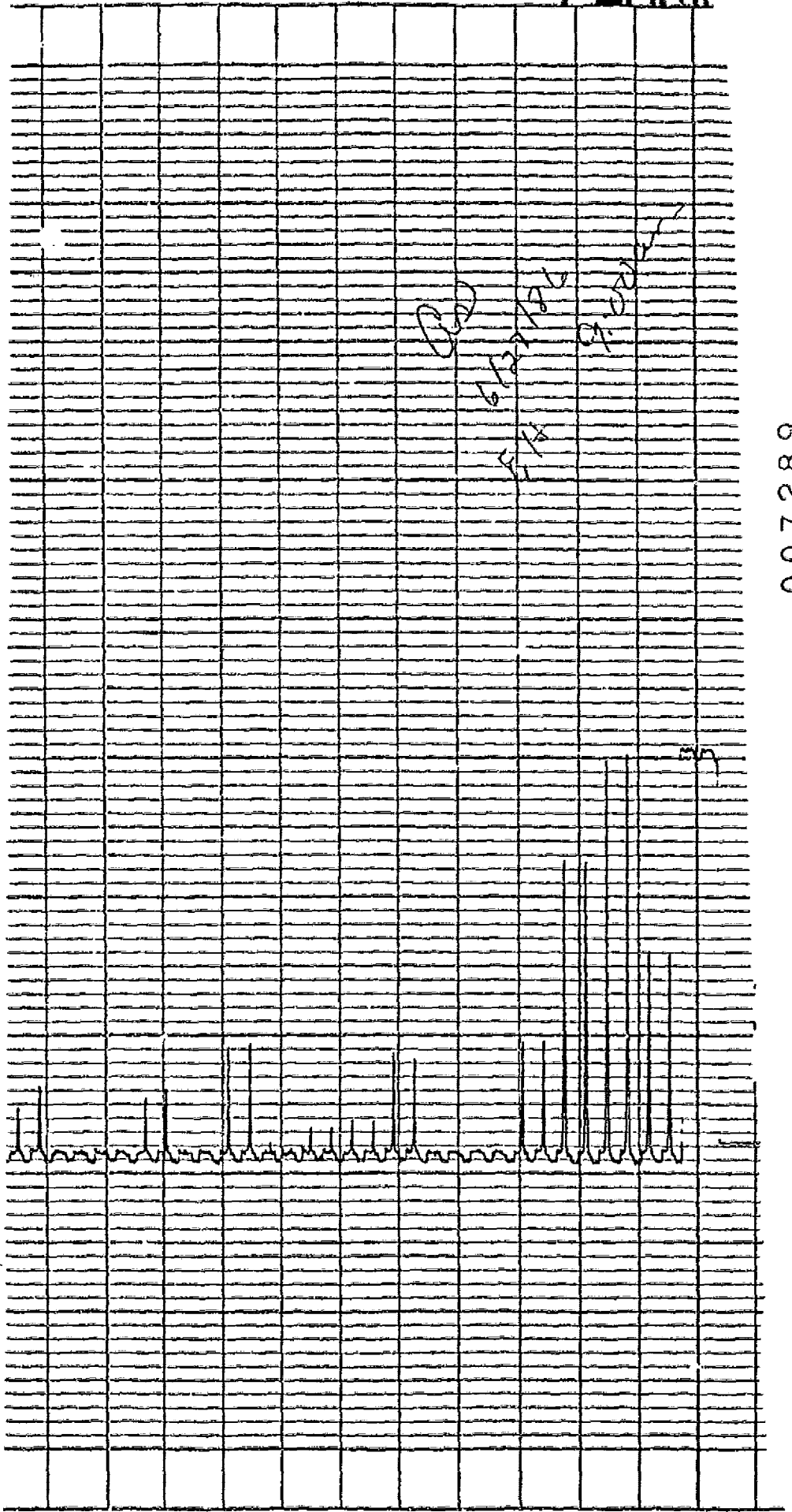
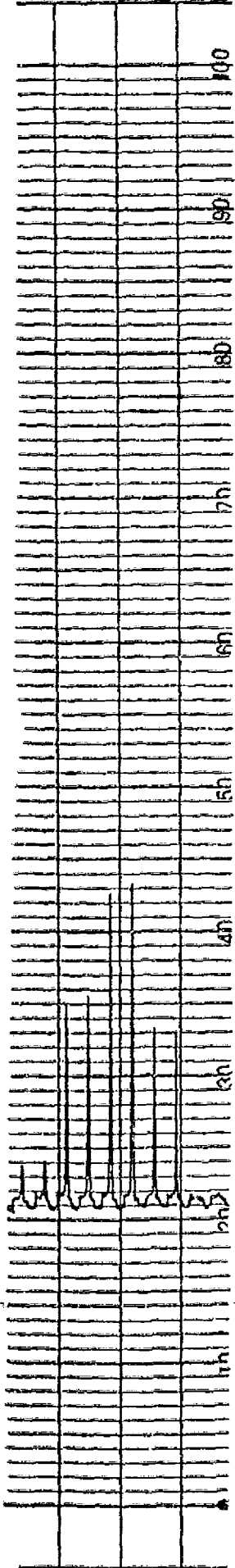
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NO. 056-7300

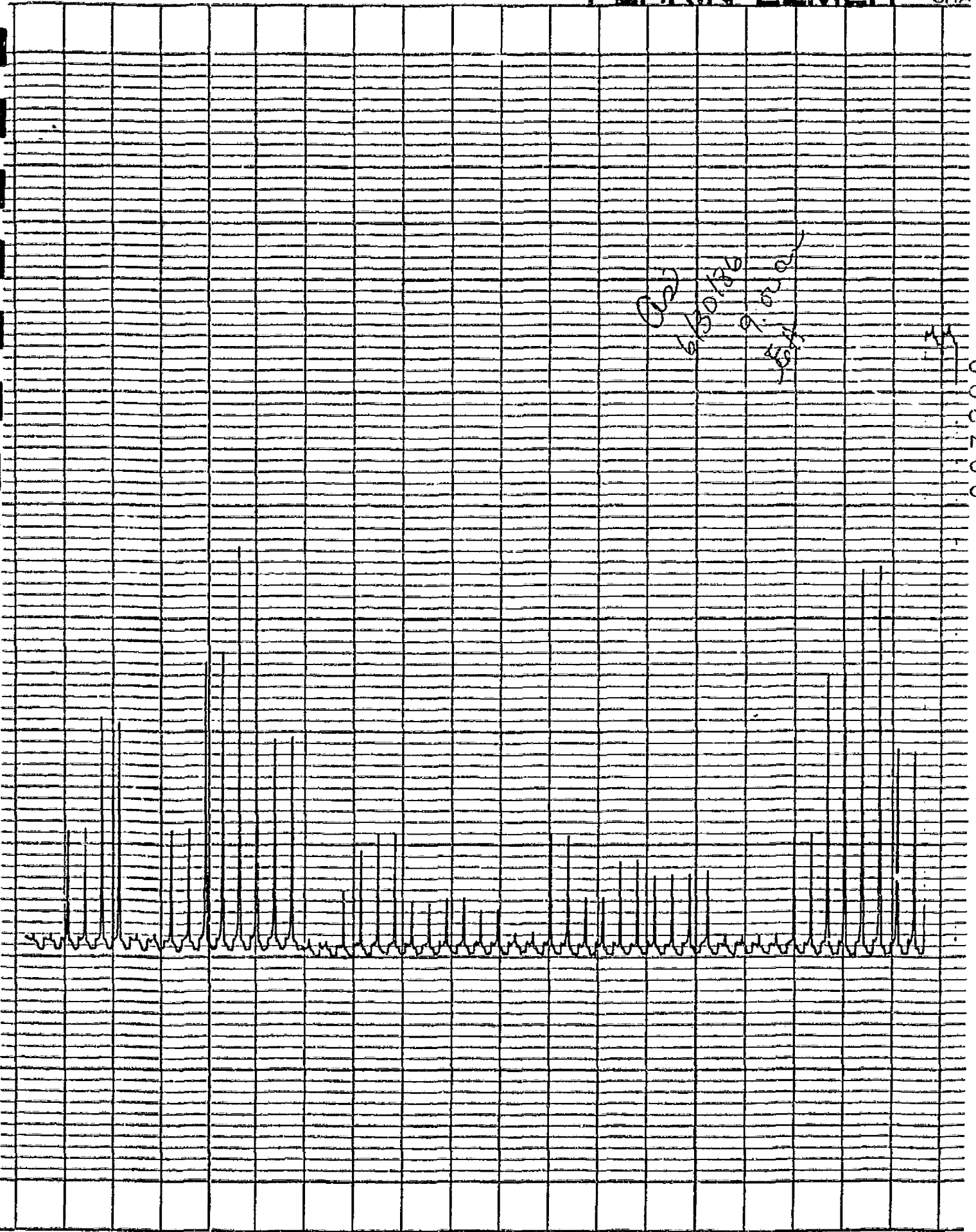
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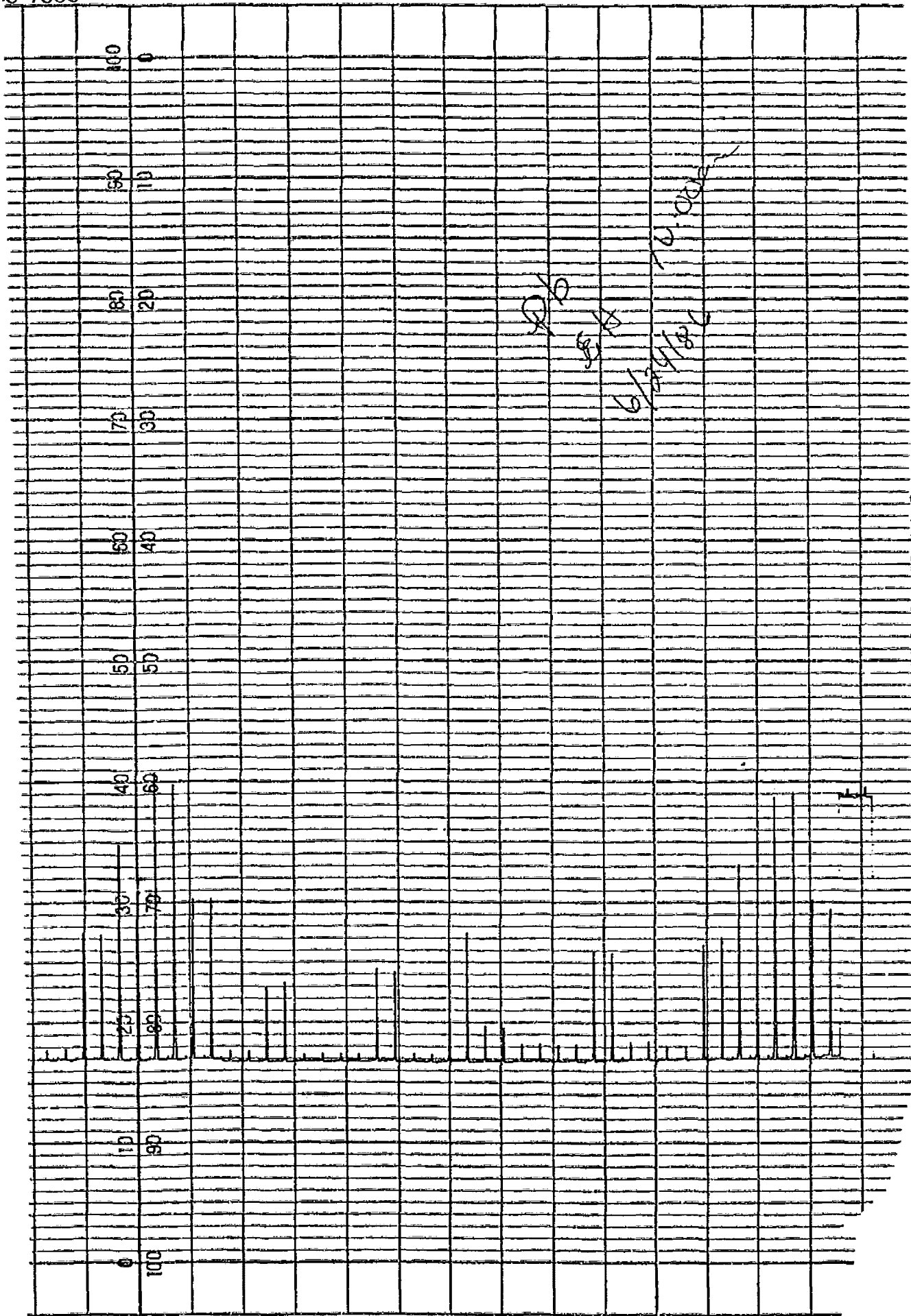
PERKIN-ELMER

PERKIN-ELMER CHA



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Peak
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9.00 min

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007290

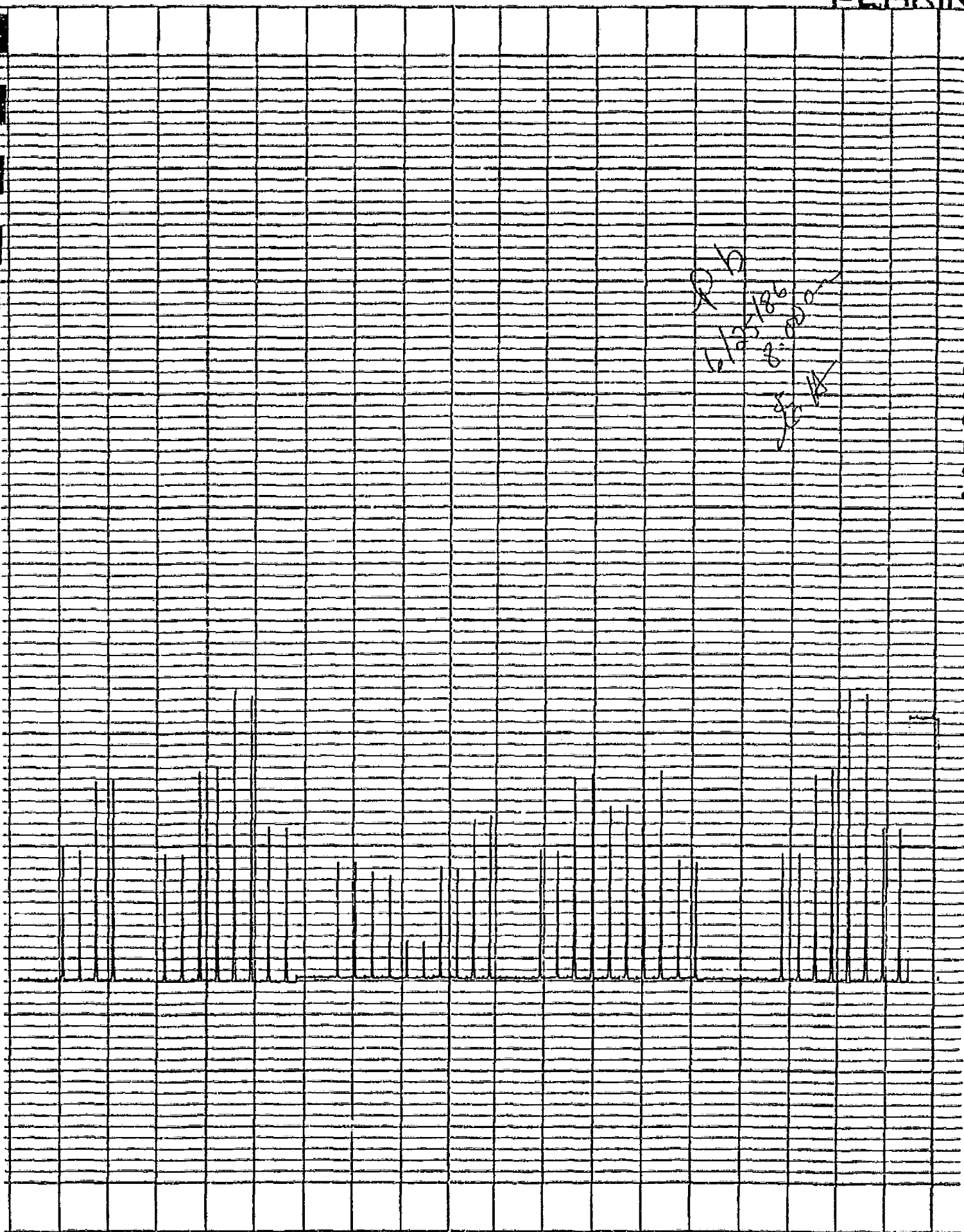


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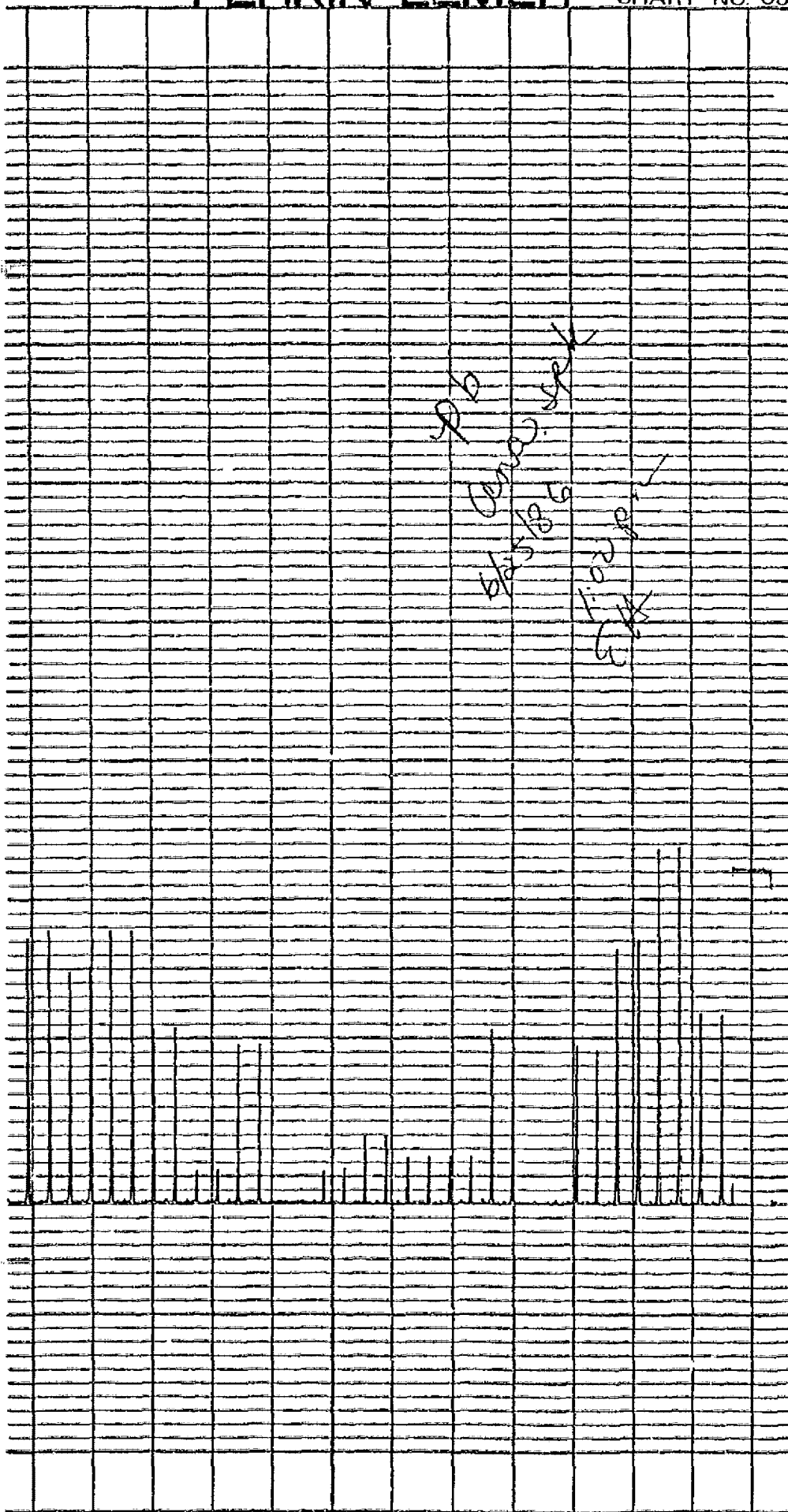
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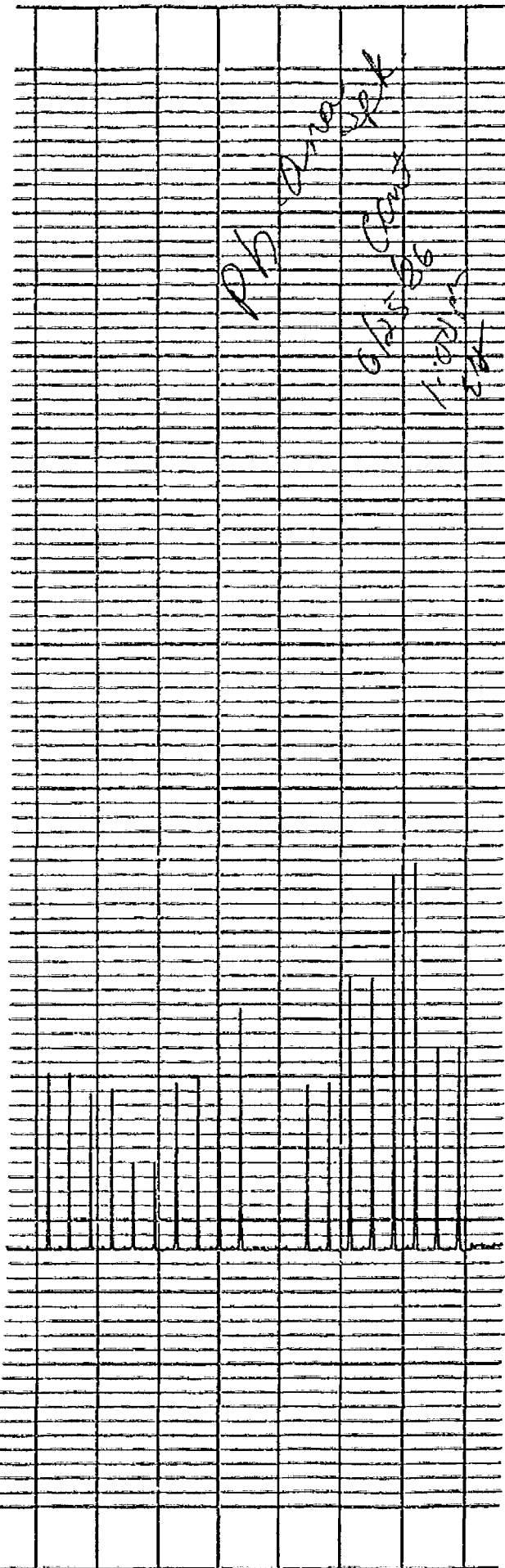
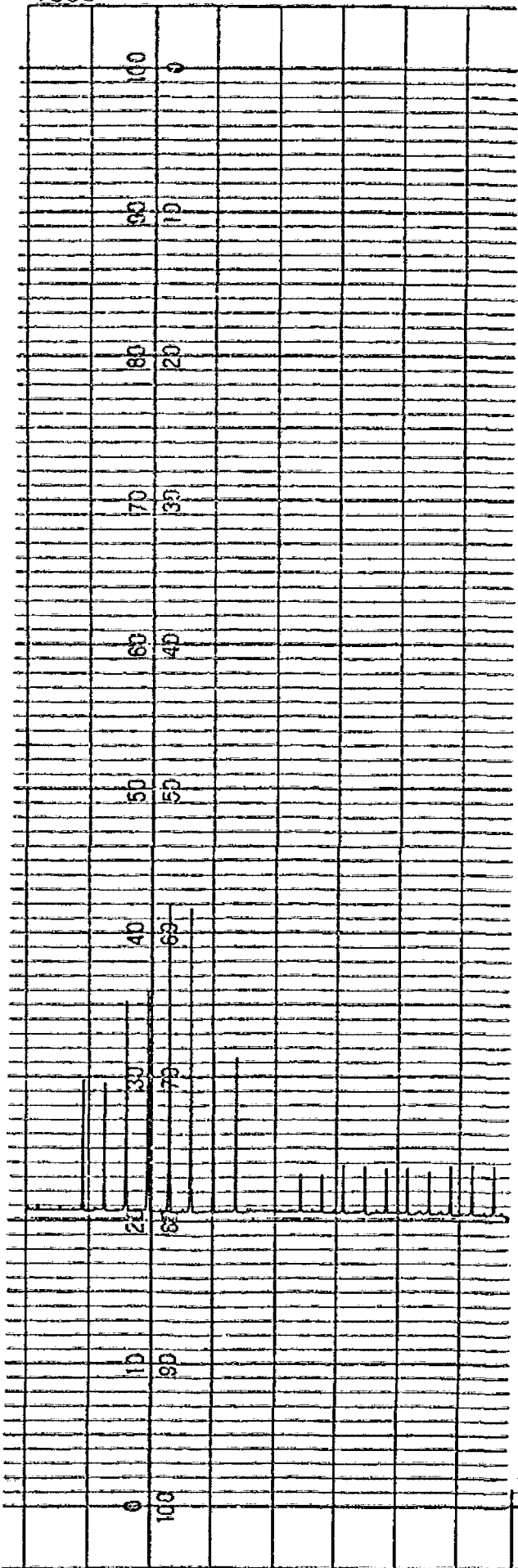
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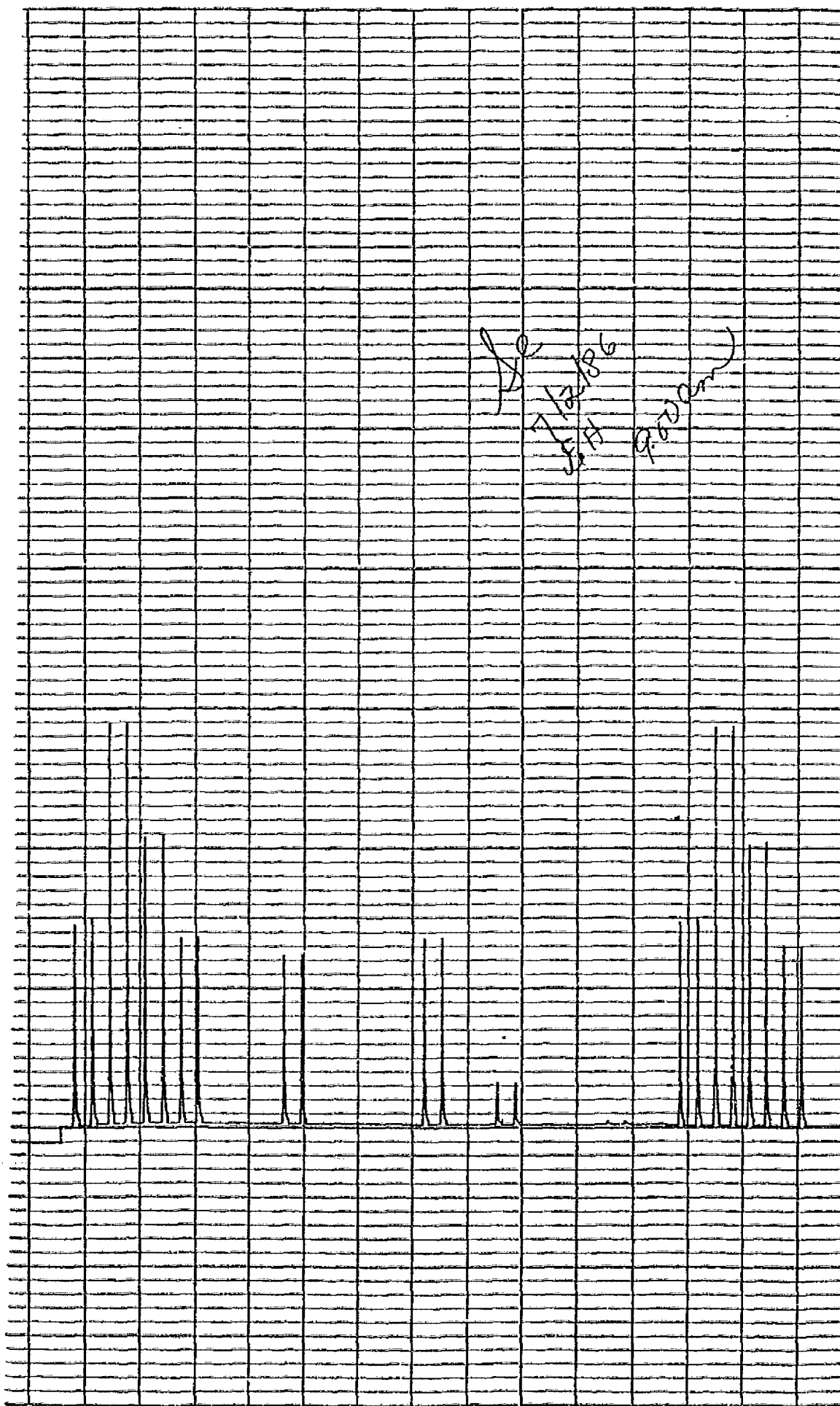


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PERKIN-ELMER

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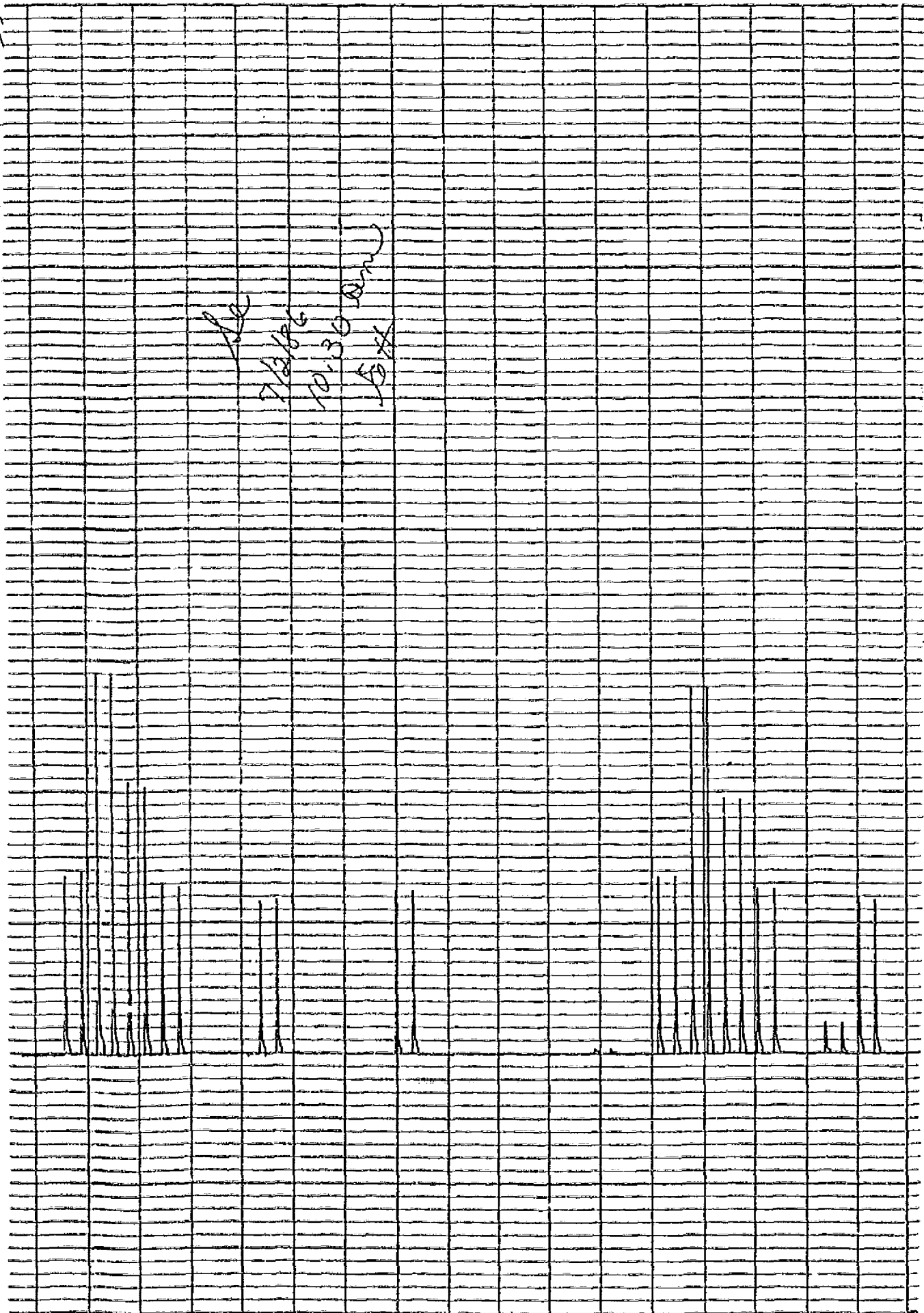
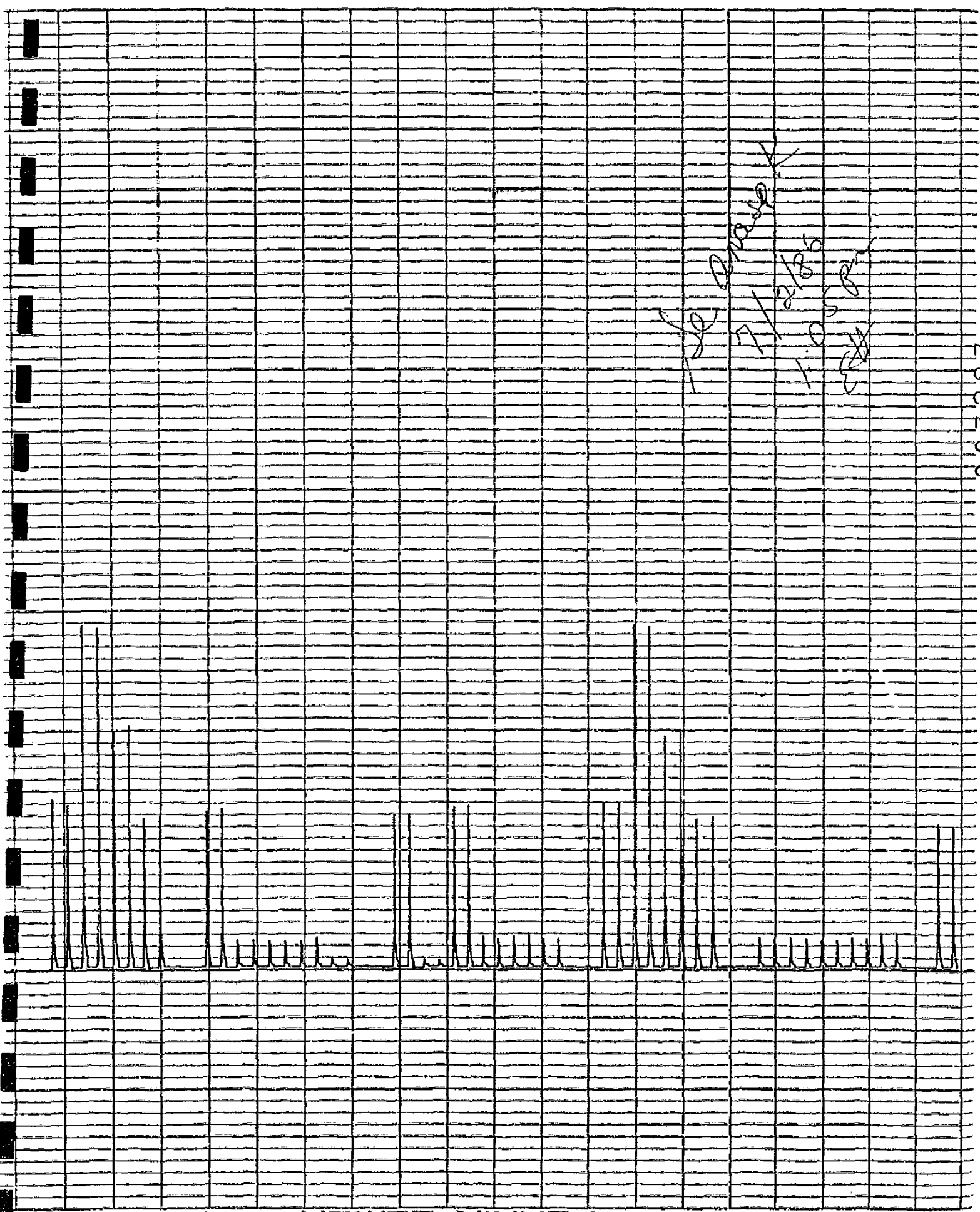


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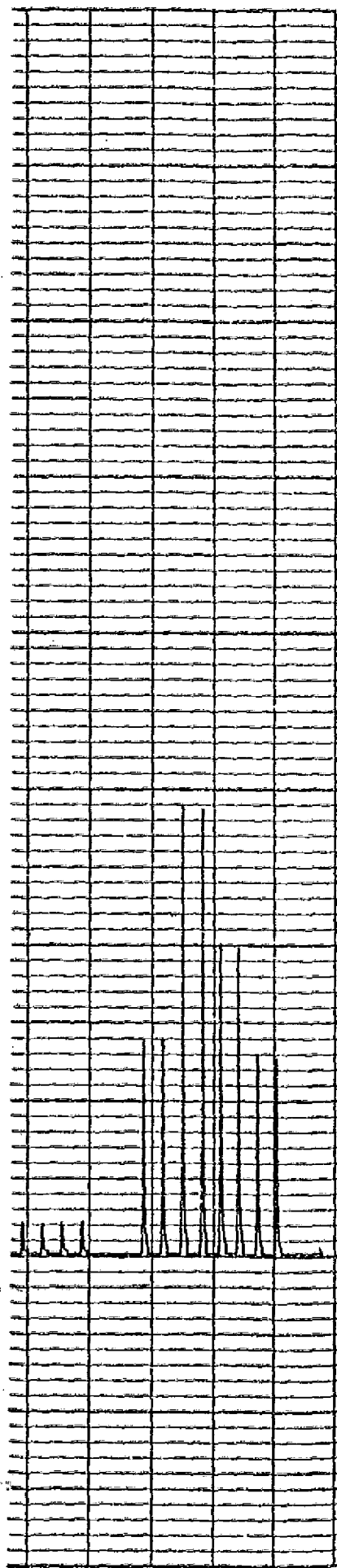
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007296



Use Group X
7/2/86
1:05 PM
CJ

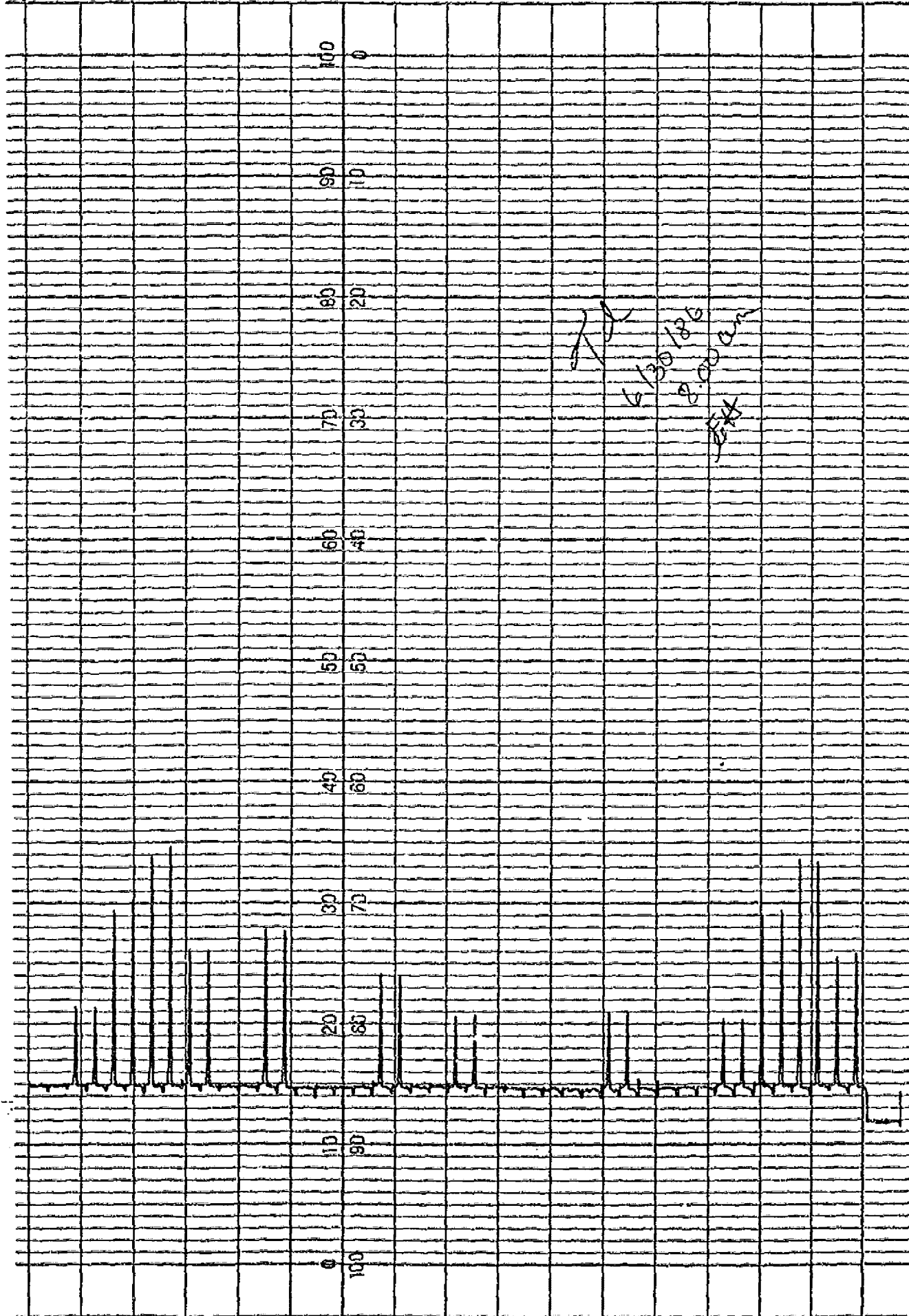
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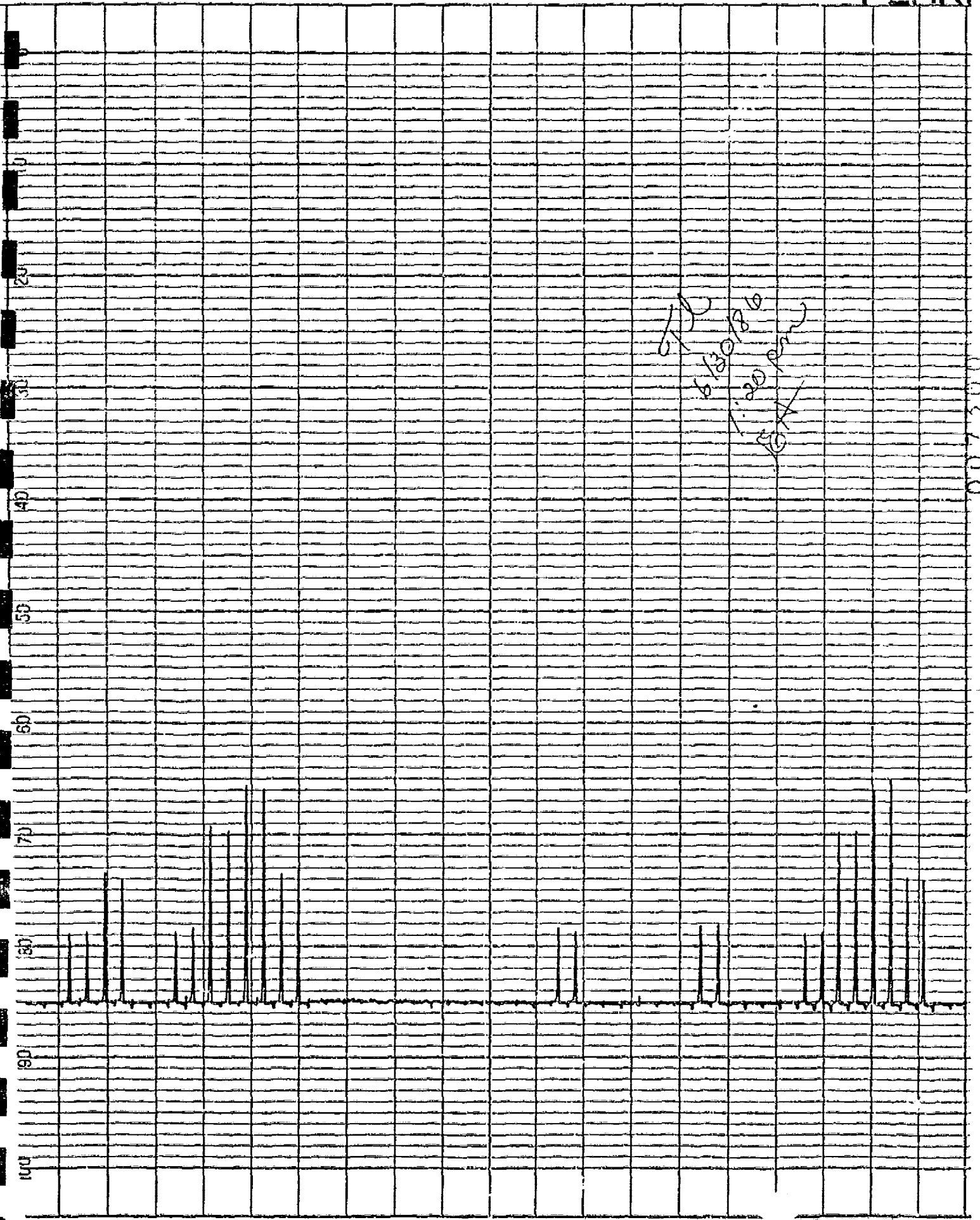
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U CHART NO. 056-7300



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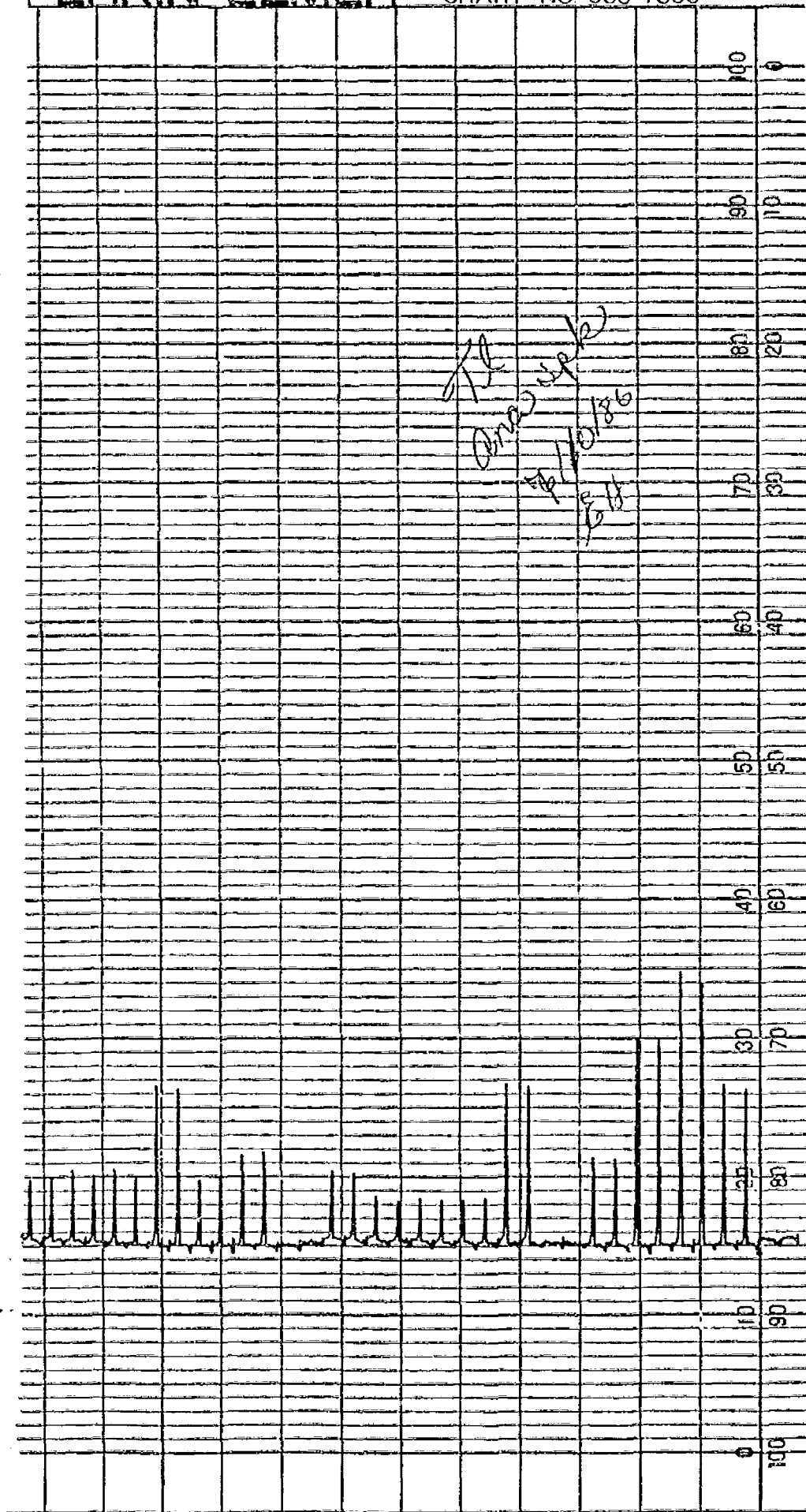


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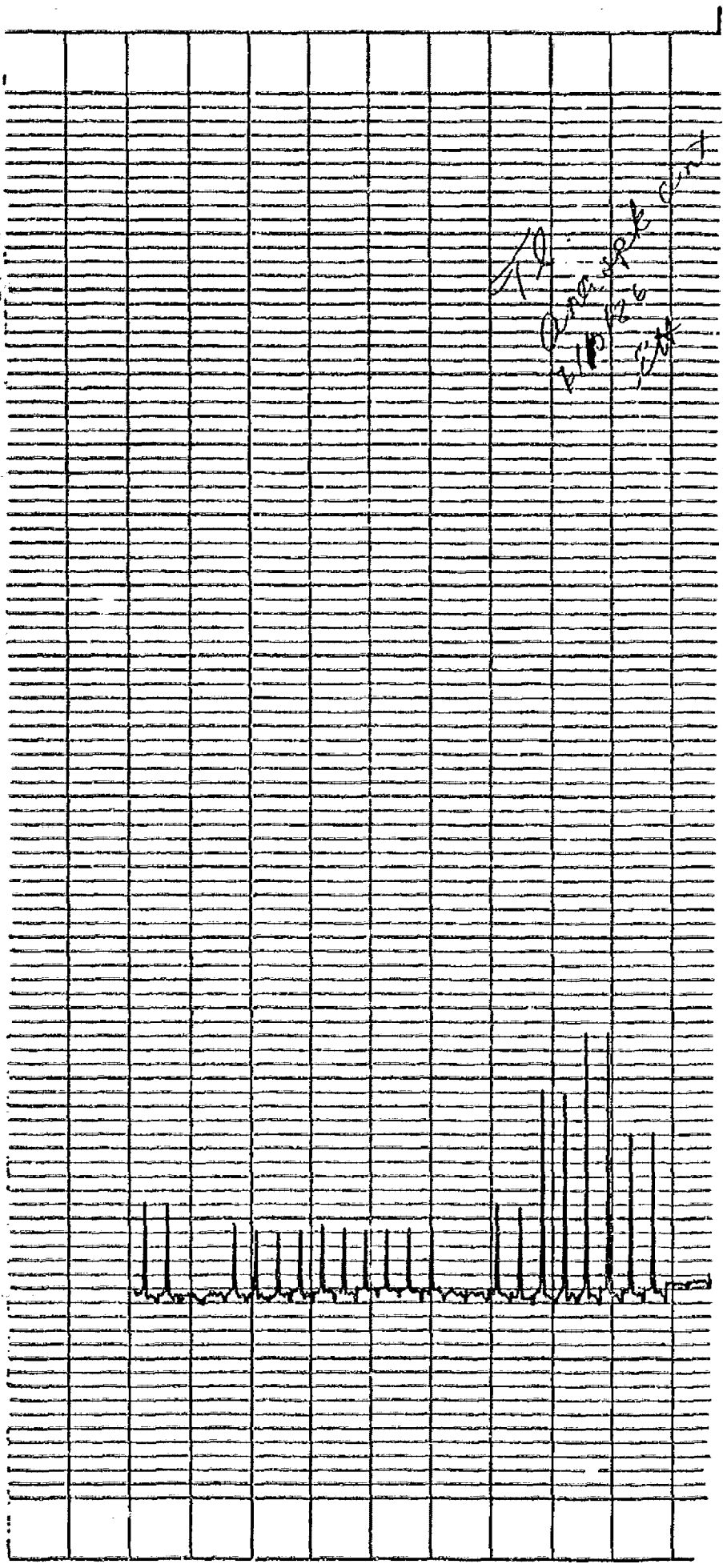
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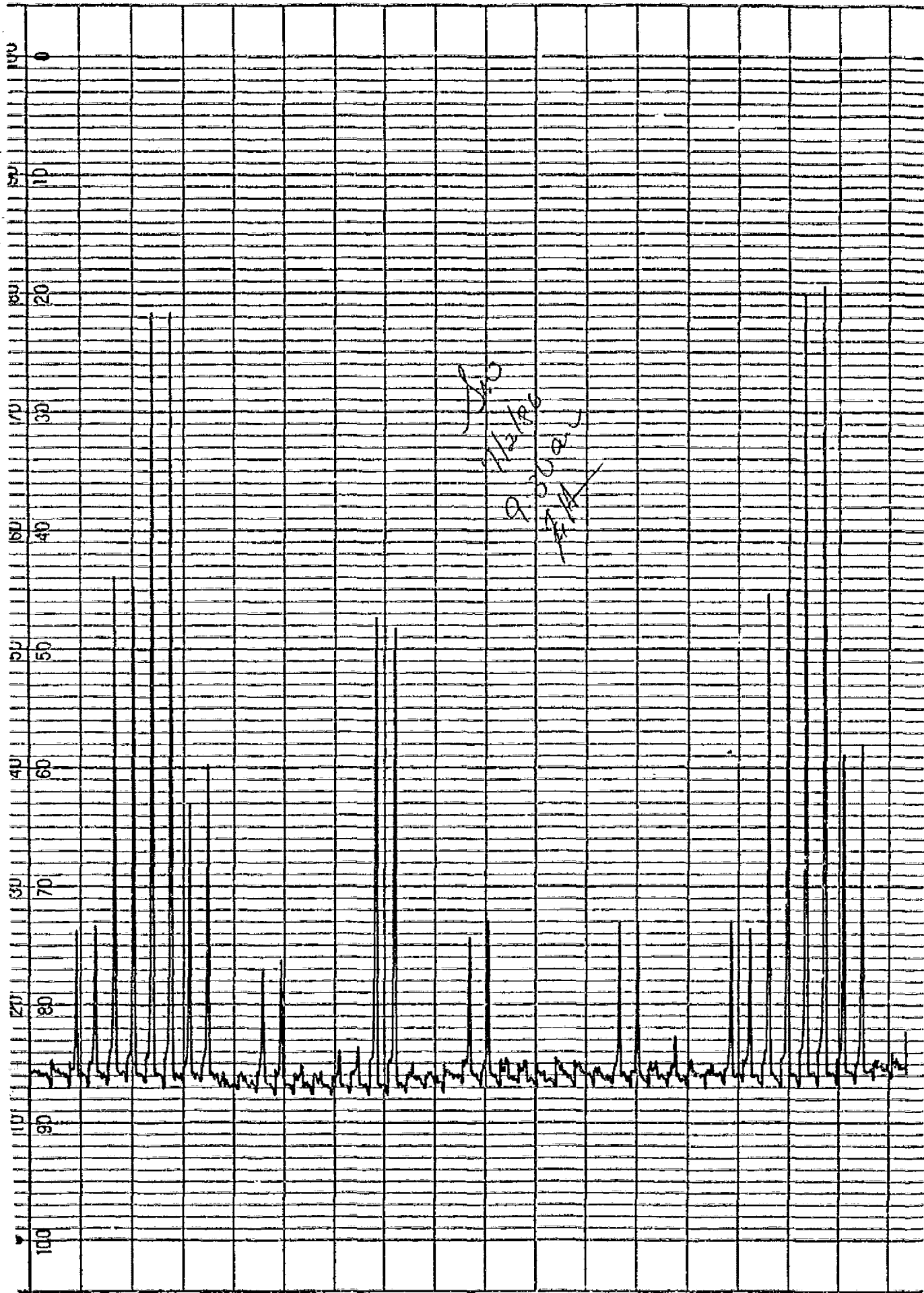
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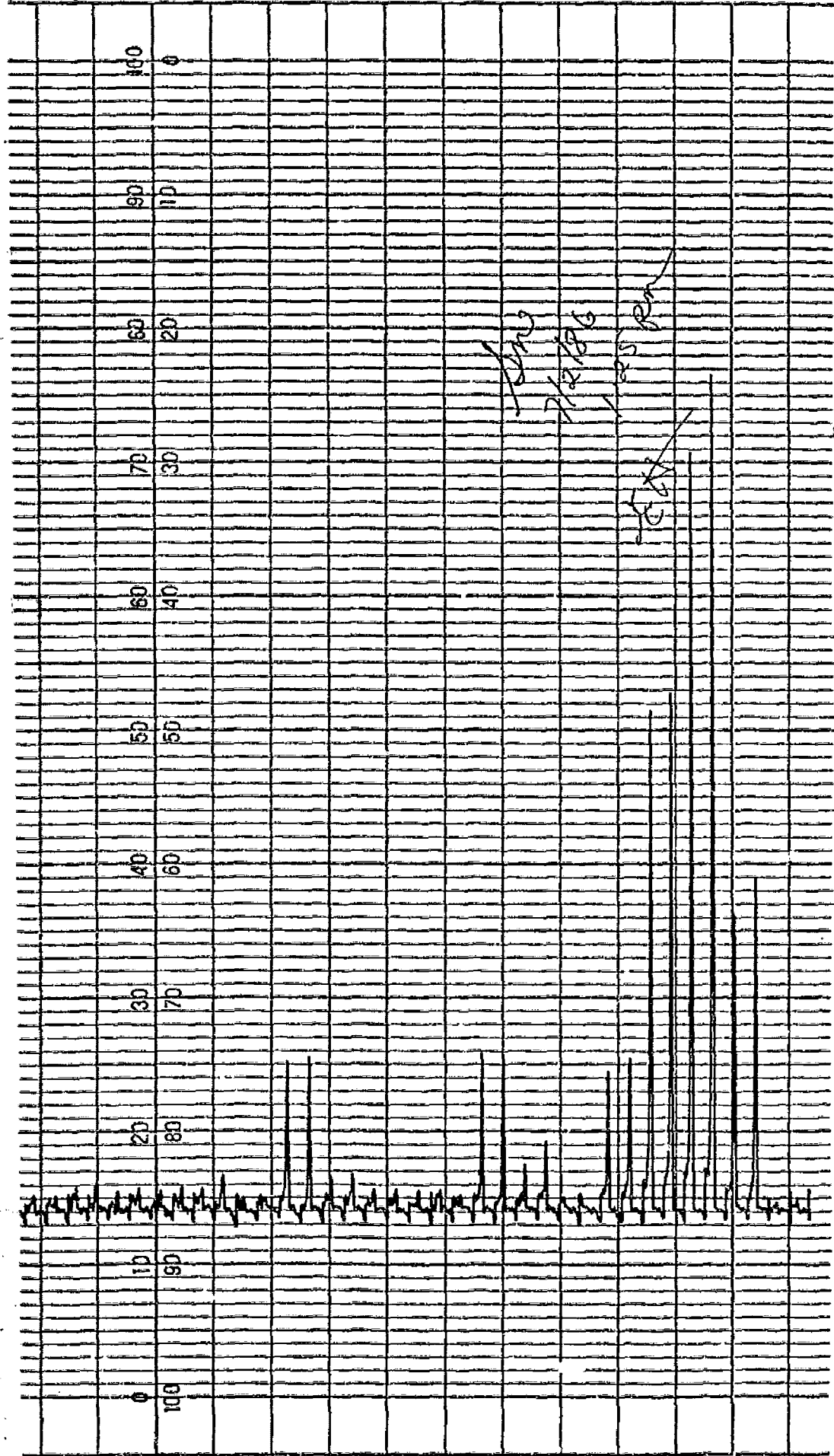


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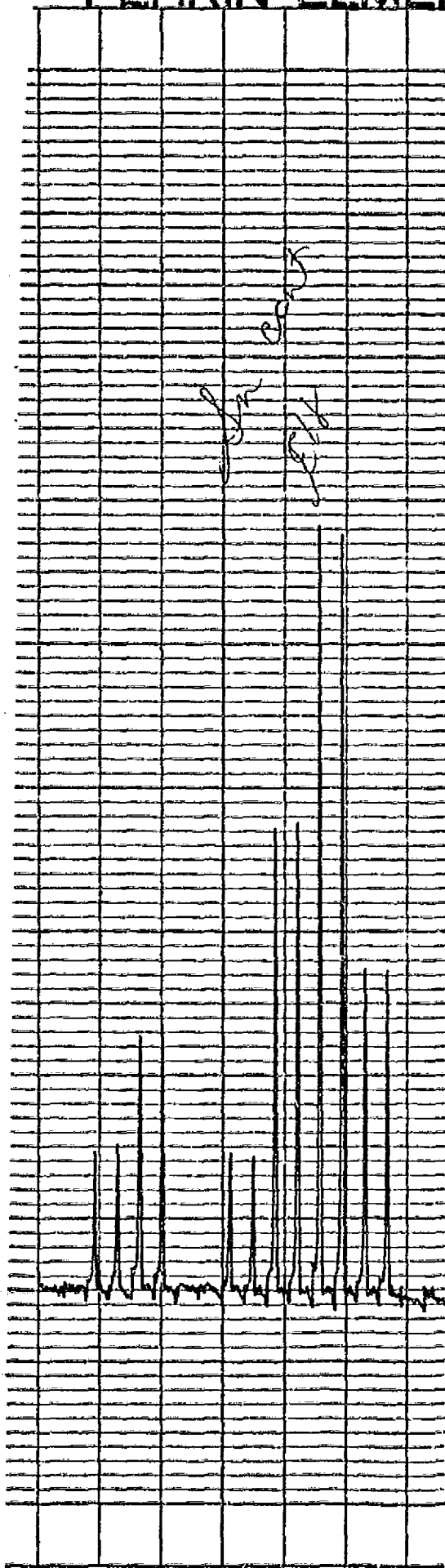
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56-7300



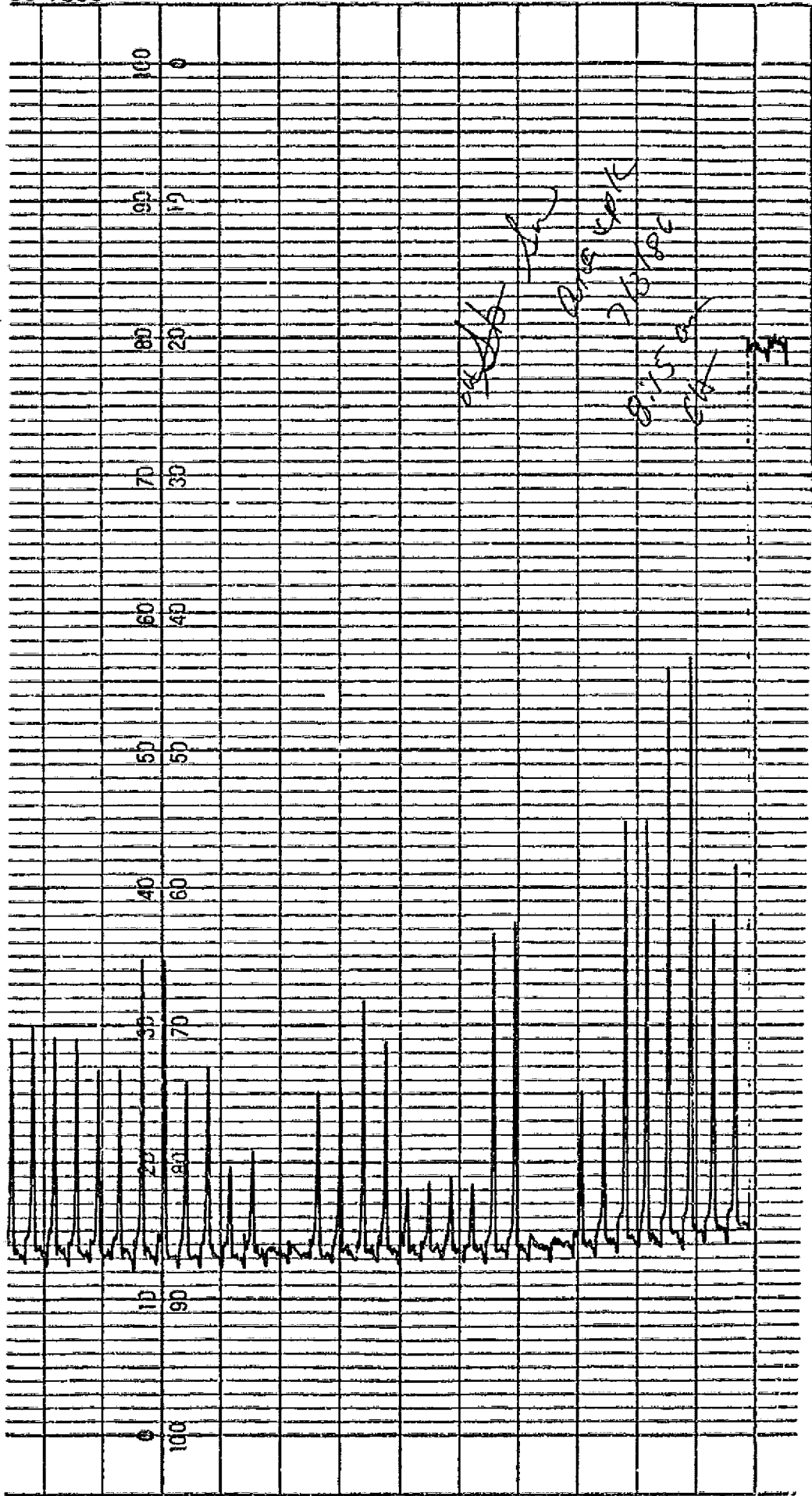
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PERKIN-ELMER



007305

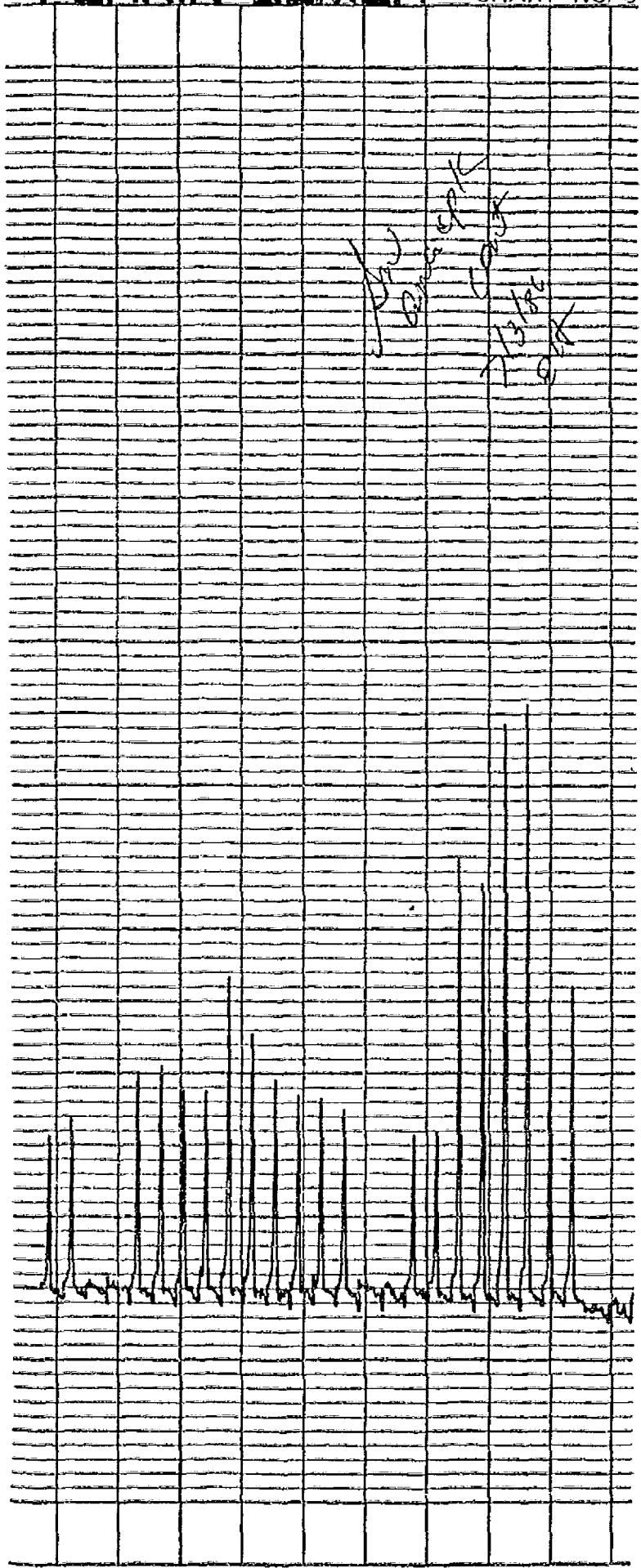
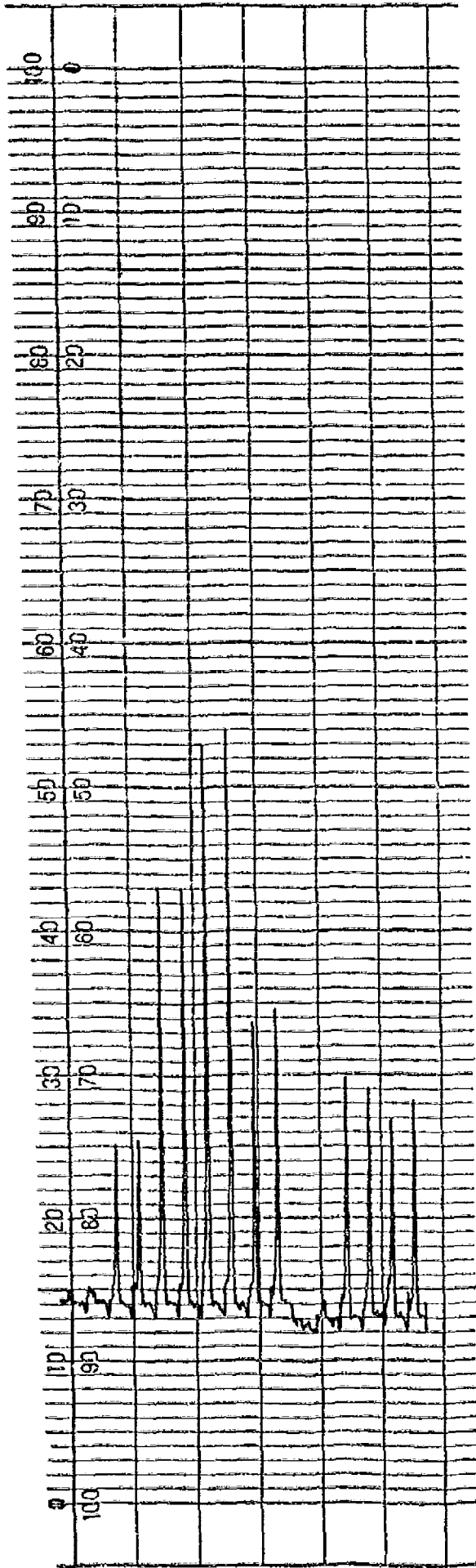
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007306

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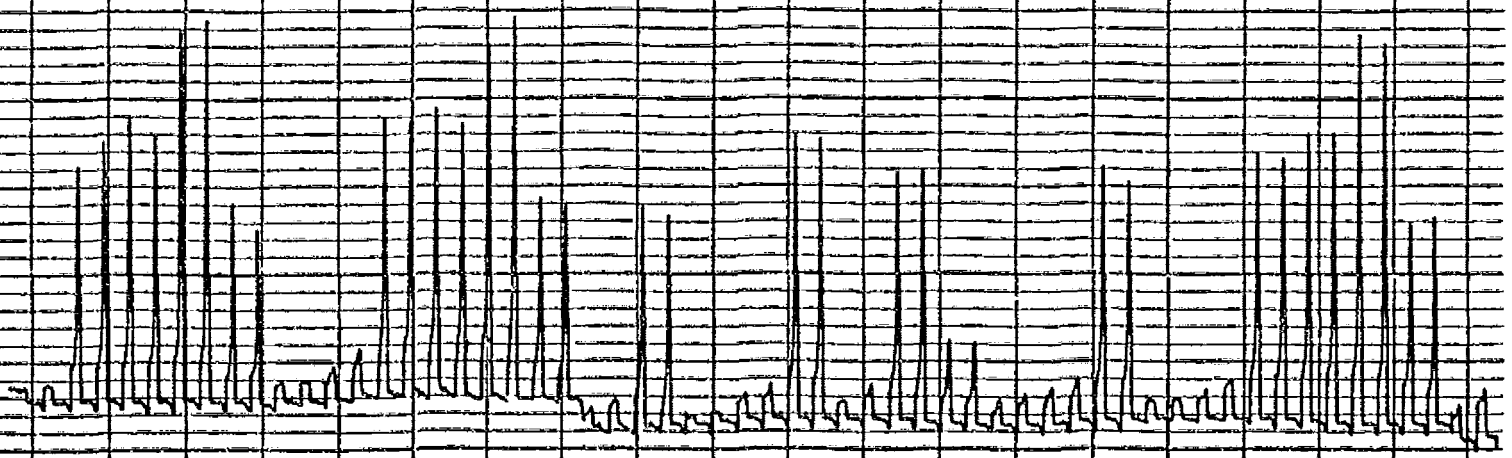


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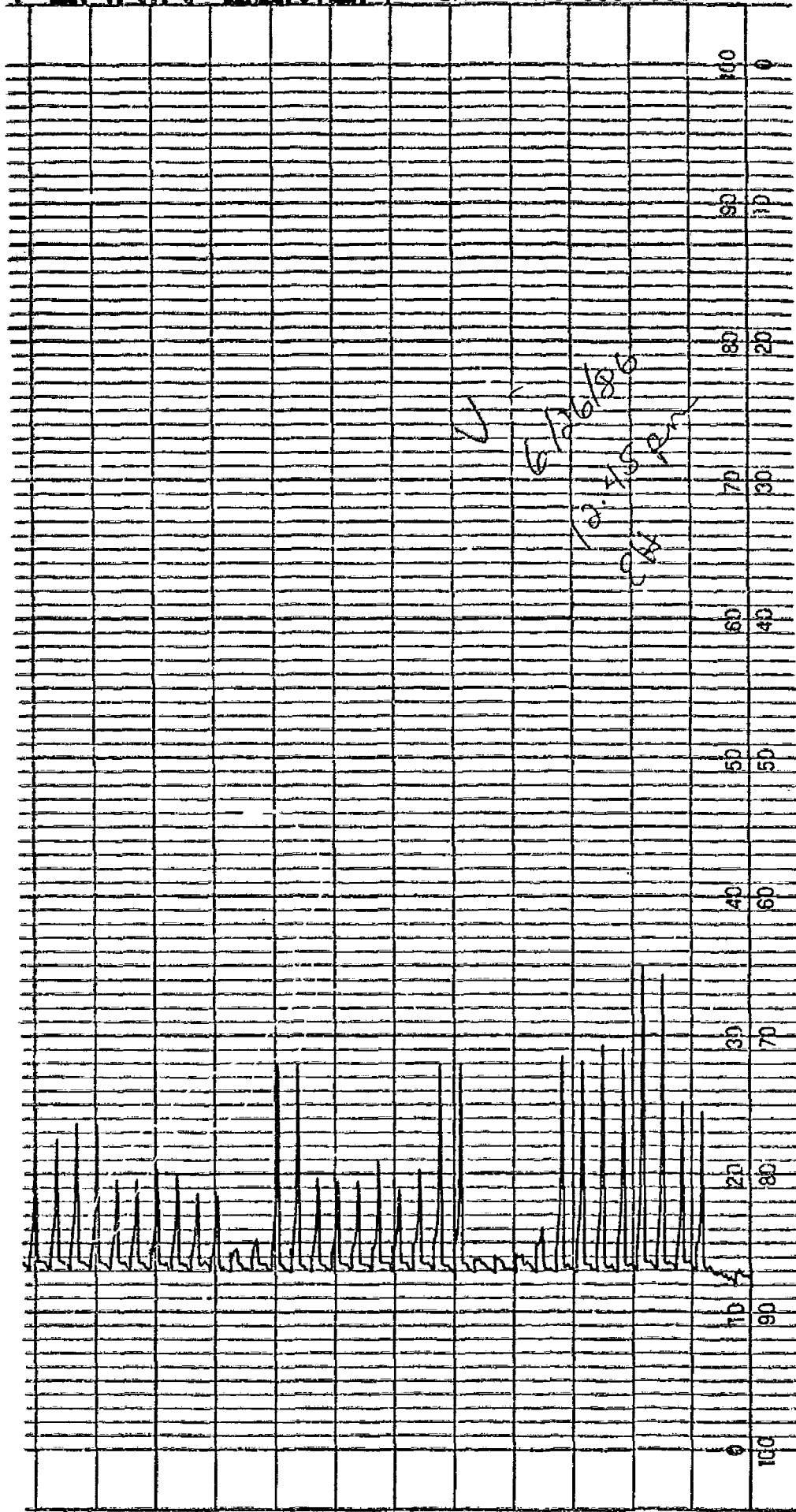
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007308

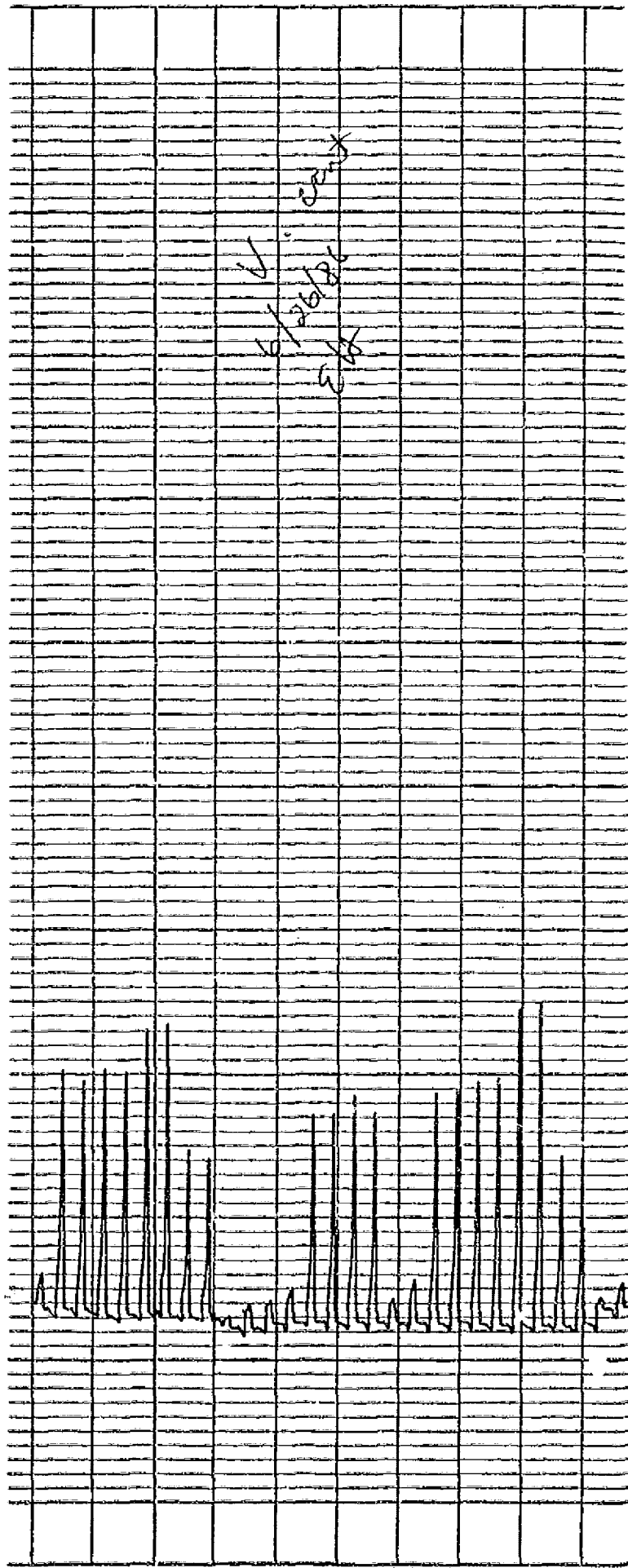


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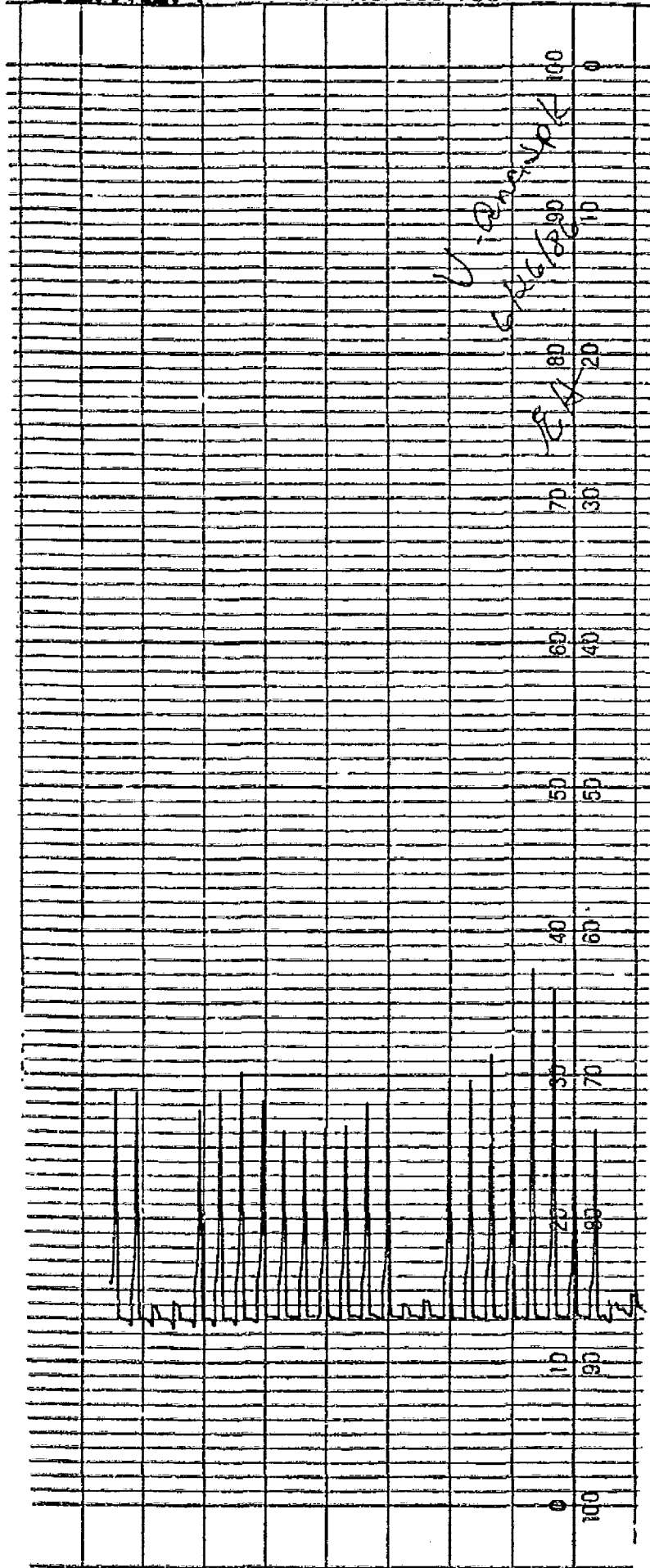
007309



007310

ELMER

CHART NO. 056-7300



007312

HGA Analytical Spikes

Element: Sb Procedure No. 3807204 Date: 7/13/86 Time 8:00am
 Wavelength: 217.6 nm BG BD PE 5000 No. 32067 Analyst: EJH
 Matrix Modifier: PE 603 No. 82034 I.D.L.: 0.005 (ppm)
 Water Soil Other _____ PE 5000Z No. 82143 Page 1 of 1

Date Prepared: 7/13/86 STANDARDS (ppm) Prepared by: EJH

	Initial	Recalibration	Final
Calibration Blank	0.000	0.000	
Standard 1	0.050 abs = 0.114	0.050	
Standard 2	0.100	0.100	
Standard 3: (0.070)	0.068 % = 97	0.065 % = 93	% =

Sample Number	Sample Dilution	Sample Conc. (ppm)	Dilution Factor	Reading 1	Reading 2	Avg. Conc. (ppm)	% Rec.
Initial Calib.	X	X	X	X	X	X	X
Calib. Verification	X	X	10	0.101	0.100	0.101	100
Calib. Blank	X	X	10	0.000	0.000	<0.005	
LCS	1.0	0.104	2.0	0.107	0.110	0.217	94
62-6021-1	1.0	<0.005	2	0.064	0.064	0.128	107
-1R	1.0	<0.005	2	0.065	0.063	0.128	107
-2	1.0	<0.005	2	0.070	0.068	0.138	115
63-6043-1	1.0	<0.005	2	0.046	0.044	0.090	75
Calib. Blank	X	X	1	0.000	0.000	<0.005	
Calib. Verification	X	X	2	0.100	0.099	0.099	98
63-6043-1R	1.0	<0.005	2	0.042	0.044	0.086	72
LCS	1.0	0.101	2	0.105	0.107	0.212	93
63-6043-2	1.0	<0.005	2	0.058	0.053	0.116	97
-2R	1.0	<0.005	2	0.058	0.057	0.115	96
-3	1.0	<0.005	2	0.051	0.052	0.103	86
Recalibration	X	X	X	X	X	X	X
Calib. Verification	X	X	1	0.097	0.097	0.097	96
Calib. Blank	X	X	1	0.000	0.000	<0.005	
63-6043-4	1.0	<0.005	2	0.051	0.054	0.105	88
-5	1.0	<0.005	2	0.049	0.048	0.097	81
-6	1.0	<0.005	2	0.053	0.052	0.105	88
-7	1.0	<0.005	2	0.052	0.052	0.104	87
-8	1.0	<0.005	2	0.055	0.054	0.109	91
Calib. Blank	X	X	1	0.000	0.000	<0.005	
Calib. Verification	X	X	1	0.098	0.098	0.098	97
Final Calibration	X	X	X	X	X	X	X
Calib. Verification							
Calib. Blank							

LCS and Calibration Verification: EPA 1183-II #2 True Value: 0.101 (ppm)

CRDL: 60 (ppb) Spike = 2 x CRDL

Comments:

Analyst Checked: EJH Date: 7/13/86
 Q.C. Approved: EJH Date: 7/13/86

62-6021-6-0030

007313

Element: Pb Procedure No. 3807205 Date: 6/30/86 Time 1:00 pm
 Wavelength: 193.7 nm BG BD PE 5000 No. 82057 Analyst: EH
 Matrix Modifier: N₂O PE 603 No. 92034 I.O.L.: 0.005 (ppm)
 Water Soil Other _____ Page 1 of 1

Date Prepared: 6/30/86 STANDARDS (ppm) Prepared by: EH

	Initial	Recalibration	Final
Calibration Blank	0.000	0.000	
Standard 1	0.050 abs = 0.263	0.050	
Standard 2	0.100	0.100	
Standard 3: (0.070)	0.070 % = 100	0.070 % = 100	% =

Sample Number	Sample Dilution	Sample Conc. (ppm)	Dilution Factor	Reading 1	Reading 2	Avg. Conc. (ppm)	% Rec.
Initial Calib.	X	X	X	X	X	X	X
Calib. Verification	X	X	1.0	0.026	0.026	0.026	96
Calib. Blank	X	X	1.0	0.0	0.000	<0.005	
LCS	1.0	0.024	1.0	0.041	0.041	0.041	85
62-6021-1	1.0	0.006	1.0	0.025	0.025	0.025	95
-1R	1.0	0.007	1.0	0.027	0.026	0.026	95
-2	1.0	<0.005	1.0	0.021	0.021	0.021	105
63-6043-1	1.0	<0.005	1.0	0.018	0.017	0.018	90
Calib. Blank	X	X	1.0	0.000	0.000	<0.005	
Calib. Verification	X	X	1.0	0.025	0.026	0.026	96
63-6043-1R	1.0	<0.005	1.0	0.018	0.018	0.018	90
LCS	1.0	0.023	1.0	0.041	0.040	0.042	90
63-6043-2	1.0	0.016	1.0	0.032	0.033	0.033	85
-2R	1.0	0.022	1.0	0.038	0.039	0.039	85
-3	1.0	0.011	1.0	0.035	0.034	0.034	115
Recalibration	X	X	X	X	X	X	X
Calib. Verification	X	X	1.0	0.025	0.026	0.025	93
Calib. Blank	X	X	1.0	0.000	0.000	<0.005	
63-6043-4	1.0	0.007	1.0	0.030	0.029	0.030	115
-5	1.0	0.010	1.0	0.031	0.029	0.030	100
-6	1.0	0.009	1.0	0.031	0.030	0.031	110
-7	1.0	0.028	1.0	0.046	0.045	0.045	85
-8	1.0	0.022	1.0	0.041	0.038	0.040	90
Calib. Blank	X	X	1.0	0.000	0.000	<0.005	
Calib. Verification	X	X	1.0	0.025	0.026	0.025	93
Final Calibration	X	X	X	X	X	X	X
Calib. Verification							
Calib. Blank							

LCS and Calibration Verification: EPA 284-I #1 True Value: 0.027 (ppm)

CRDL: 10 (ppb) Spike = 2 x CRDL

Comments: _____ Analyst Checked: EH Date: 6/30/86
 Q.C. Approved: EH Date: 7/2/86

007314

HGA Analytical Spikes

Element: Pb Procedure No. 3807213 Date: 6/25/86 Time 1:00 pm
 Wavelength: 283.3 nm BG BD PE 5000 No. 82051 Analyst: E.H.
 Matrix Modifier: NH₄H₂PO₄ + Mg NO₃ PE 603 No. 92034 I.D.L.: 0.005 (ppm)
 Water Soil Other Page 1 or 1

STANDARDS (ppm)
 Date Prepared: 6/25/86 Prepared by: E.H.

	Initial	Recalibration	Final
Calibration Blank	0.000	0.000	0.000
Standard 1	0.050 abs = 0.251	0.050	0.050
Standard 2	0.100	0.100	0.100
Standard 3: (0.070)	0.070 % = 100	0.069 % = 99	0.069 % = 99

Sample Number	Sample Dilution	Sample Conc. (ppm)	Dilution Factor	Reading 1	Reading 2	Avg. Conc. (ppm)	% Rec.
Initial Calib.	X	X	X	X	X	X	X
Calib. Verification	X	Y	1.0	0.040	0.040	0.040	93
Calib. Blank	Y	X	1.0	0.000	0.000	<0.005	
LCS	1.0	0.038	1.0	0.049	0.049	0.049	110
62-6021-1	1.0	<0.005	1.0	0.012	0.012	0.012	120
-1R	1.0	<0.005	1.0	0.012	0.012	0.012	120
-2	1.0	0.008	1.0	0.017	0.018	0.018	100
63-6043-1	1.0	<0.005	1.0	0.009	0.009	0.009	90
Calib. Blank	X	Y	1.0	0.000	0.000	<0.005	
Calib. Verification	Y	X	1.0	0.040	0.040	0.040	93
63-6043-1R	1.0	<0.005	1.0	0.008	0.008	0.008	80
LCS	1.0	0.039	1.0	0.050	0.050	0.050	110
63-6043-2	1.0	0.072	1.0	0.074	0.074	0.074	20 RR
-2R	1.0	0.058	1.0	0.063	0.062	0.062	40 RR
-3	1.0	0.069	1.0	0.073	0.071	0.072	30 RR
Recalibration	X	X	X	X	X	X	X
Calib. Verification	X	Y	1.0	0.040	0.039	0.040	93
Calib. Blank	X	X	1.0	0.000	0.000	<0.005	
63-6043-4	1.0	0.059	1.0	0.062	0.062	0.062	30 RR
-5	1.0	0.036	1.0	0.039	0.051	0.045	90
-6	1.0	0.012	1.0	0.021	0.021	0.021	90
-7	1.0	0.036	1.0	0.040	0.038	0.039	30 RR
-8	1.0	0.039	1.0	0.050	0.050	0.050	110
Calib. Blank	X	X	1.0	0.000	0.000	<0.005	
Calib. Verification	X	X	1.0	0.040	0.040	0.040	93
63-6043-2	10	0.007	10	0.017	0.017	0.017	100
-2R	10	0.006	54 + 0.16	0.016	0.015	0.016	90
-3	10	0.007	21 + 0.10	0.016	0.016	0.016	90
-4	10	0.006	10	0.017	0.017	0.017	110
-7	10	0.004	10	0.015	0.015	0.015	110
Final Calibration	X	X	X	X	X	X	X
Calib. Verification							
Calib. Blank							

LCS and Calibration Verification: EPA 284-I #1 True Value: 0.043 (ppm)

CRDL: 5 (ppb) Spike = 2 x CRDL

Comments: Analyst Checked: E.H. Date: 6/25/86
 Q.C. Approved: E.H. Date: 7/2/86

007315

HCA Analytical Spikes

Element: Se Procedure No. 3807316 Date: 7/2/86 Time 1:05 pm
 Wavelength: 196.0 nm BG BZ PE 5000 No. 82067 Analyst: E.H.
 Matrix Modifier: N₂, NO₂ PE 603 No. 82034 I.D.L.: 0.005 (ppm)
 Water Scil Other PE 5000Z No. 82143 Page 1 of 1

STANDARDS (ppm)
 Date Prepared: 7/2/86 Prepared by: E.H.

	Initial	Recalibration	Final
Calibration Blank	0.000	0.000	0.000
Standard 1	0.050 abs = 0.152	0.050	0.050
Standard 2	0.100	0.100	0.100
Standard 3: (0.070)	0.071 % = 101	0.070 % = 100	0.071 % = 101

Sample Number	Sample Dilution	Sample Conc. (ppm)	Dilution Factor	Reading 1	Reading 2	Avg. Conc. (ppm)	% Rec.
Initial Calib.	X	X	X	X	X	X	X
Calib. Verification	Y	X	1.0	0.045	0.046	0.046	92
Calib. Blank	X	X	1.0	0.000	0.000	<0.005	
LCS	1.0	0.040	1.0	0.050	0.051	0.050	100
62-6021-1	1.0	<0.005	1.0	0.009	0.008	0.009	90
-1R	1.0	<0.005	1.0	0.008	0.008	0.008	80
-2	1.0	<0.005	1.0	0.008	0.009	0.008	80
63-6043-1	1.0	<0.005	1.0	0.003	0.003	0.003	RR
Calib. Blank	Y	X	1.0	0.000	0.000	<0.005	
Calib. Verification	Y	Y	1.0	0.046	0.046	0.046	92
63-6043-1R	1.0	<0.005	1.0	0.003	0.003	0.003	RR
LCS	1.0	0.041	1.0	0.050	0.051	0.050	90
63-6043-2	1.0	<0.005	1.0	0.010	0.009	0.010	100
-2R	1.0	<0.005	1.0	0.010	0.010	0.010	100
-3	1.0	<0.005	1.0	0.010	0.010	0.010	100
Recalibration	X	X	X	X	X	X	X
Calib. Verification	Y	Y	1.0	0.046	0.046	0.046	92
Calib. Blank	Y	Y	1.0	0.001	0.001	<0.005	
63-6043-4	1.0	<0.005	1.0	0.010	0.010	0.010	100
-5	1.0	<0.005	1.0	0.010	0.010	0.010	100
-6	1.0	<0.005	1.0	0.010	0.010	0.010	100
-7	1.0	<0.005	1.0	0.010	0.010	0.010	100
-8	1.0	<0.005	1.0	0.011	0.011	0.011	110
Calib. Blank	X	X	1.0	0.000	0.001	<0.005	
Calib. Verification	Y	Y	1.0	0.045	0.046	0.046	92
63-6043-1	10	<0.005	10	0.009	0.009	0.009	90
-1R	10	<0.005	10	0.009	0.009	0.009	90
Final Calibration	X	X	X	X	X	X	X
Calib. Verification	Y	X	1.0	0.046	0.046	0.046	92
Calib. Blank	Y	X	1.0	0.001	0.000	<0.005	

007316

LCS and Calibration verification: EPA 284-I #1 True Value: 0.050 (ppm)

CRDL: 5 (ppb) Spike = 2 x CRDL

Comments:

Analyst Checked: E.H. Date: 7/2/86
 Q.C. Approved: E.H. Date: 7/3/86

Element: As Procedure No. 3807218 Date: 7/1/86 Time 8:00am
 Wavelength: 276.8 nm BG GD PE 5000 No. 82057 Analyst: EH
 Matrix Modifier: PE 603 No. 92034 I.O.L.: 0.005 (ppm)
 Water Soil Other _____ Page 1 or 1

STANDARDS (ppm)
 Date Prepared: 7/1/86 Prepared by: EH

	Initial	Recalibration	Final
Calibration Blank	0.000	0.070	
Standard 1	0.050 abs = 0.128	0.050	
Standard 2	0.100	0.100	
Standard 3: (0.070)	0.068 % = 97	0.070 % = 100	% =

Sample Number	Sample Dilution	Sample Conc. (ppm)	Dilution Factor	Reading 1	Reading 2	Avg. Conc. (ppm)	% Rec.
Initial Calib.	X	X	X	X	X	X	X
Calib. Verification	X	Y	1.0	0.026	0.026	0.026	104
Calib. Blank	X	Y	1.0	0.002	0.001	<0.005	
LCS	1.0	0.027	1.0	0.047	0.047	0.047	100
62-6021-1	1.0	<0.005	1.0	0.014	0.014	0.014	70
-1R	1.0	<0.005	1.0	0.013	0.013	0.013	65
-2	1.0	<0.005	1.0	0.013	0.014	0.014	70
63-6043-1	1.0	<0.005	1.0	0.021	0.021	0.021	105
Calib. Blank	Y	Y	1.0	0.002	0.002	<0.005	
Calib. Verification	X	Y	1.0	0.027	0.027	0.027	108
63-6043-1R	1.0	<0.005	1.0	0.020	0.020	0.020	100
LCS	1.0	0.028	1.0	0.048	0.049	0.049	105
63-6043-2	1.0	<0.005	1.0	0.020	0.022	0.021	105
-2R	1.0	<0.005	1.0	0.021	0.022	0.022	110
-3	1.0	<0.005	1.0	0.020	0.020	0.020	100
Recalibration	X	X	X	X	X	X	X
Calib. Verification	Y	X	1.0	0.024	0.024	0.024	96
Calib. Blank	Y	Y	1.0	0.000	0.000	<0.005	
63-6043-4	1.0	<0.005	1.0	0.015	0.017	0.016	80
-5	1.0	<0.005	1.0	0.016	0.017	0.017	85
-6	1.0	<0.005	1.0	0.018	0.019	0.019	95
-7	1.0	<0.005	1.0	0.017	0.017	0.017	85
-8	1.0	<0.005	1.0	0.017	0.019	0.018	90
Calib. Blank	X	X	1.0	0.000	0.000	<0.005	
Calib. Verification	X	X	1.0	0.025	0.025	0.025	100
Final Calibration	X	X	X	X	X	X	X
Calib. Verification							
Calib. Blank							

LCS and Calibration Verification: EPA 1183-I #1 True Value: 0.025 (ppm)

CRDL: 10 (ppb) Spike = 2 x CRDL

Comments: _____ Analyst Checked: EH Date: 7/1/86
 Q.C. Approved: EH Date: 7/2/86

007317

HGA Analytical Spikes

Element: Sn Procedure No. 3807219 Date: 7/3/86 Time 8:15am
 Wavelength: 224.6 nm BG BD PE 5000 No. 82067 Analyst: EH
 Matrix Modifier: PE 603 No. 82034 ✓ I.D.L.: 0.005 (ppm)
 Water ✓ Soil ✓ Other _____ PE 5000Z No. 82143 Page 1 of 1

STANDARDS (ppm)
 Date Prepared: 7/3/86 Prepared by: EH

	Initial	Recalibration	Final
Calibration Blank	0.000	0.000	0.000
Standard 1	0.100 abs = 0.239	0.100	0.100
Standard 2	0.200	0.200	0.200
Standard 3: (0.150)	0.142 % = 95	0.149 % = 99	0.148 % = 97

Sample Number	Sample Dilution	Sample Conc. (ppm)	Dilution Factor	Reading 1	Reading 2	Avg. Conc. (ppm)	% Rec.
Initial Calib.	X	X	X	X	X	X	X
Calib. Verification	Y	X	1.0	0.049	0.045	0.047	94
Calib. Blank	X	X	1.0	0.000	0.000	<0.005	
LCS	1.0	0.049	1	0.132	0.127	0.130	101
62-6021-1	1.0	<0.005	1	0.017	0.018	0.018	23 RR
-12	1.0	<0.005	1	0.016	0.015	0.016	20 RR
-2	1.0	<0.005	1	0.026	0.029	0.023	91
63-6043-7	1.0	0.006	1	0.048	0.046	0.047	51
Calib. Blank	X	X	1	0.000	0.000	<0.005	
Calib. Verification	X	X	1	0.053	0.048	0.051	102
63-6043-12	1.0	<0.005	1	0.047	0.045	0.046	58
LCS	1.0	0.055	1	0.125	0.133	0.129	93
63-6043-2	1.0	<0.005	1	0.054	0.057	0.056	70
-2R	1.0	<0.005	1	0.065	0.067	0.066	83
-3	1.0	0.010	1	0.070	0.064	0.067	71
Recalibration	X	X	X	X	X	X	X
Calib. Verification	X	X	1	0.055	0.052	0.054	108
Calib. Blank	X	X	1	0.003	0.003	<0.005	
63-6043-4	1.0	0.008	1	0.061	0.063	0.062	68
-5	1.0	<0.005	1	0.067	0.071	0.069	86
-6	1.0	<0.005	1	0.087	0.110	0.099	124
-7	1.0	0.006	1	0.066	0.067	0.067	76
-8	1.0	<0.005	1	0.076	0.074	0.075	94
Calib. Blank	X	X	1	0.003	0.004	<0.005	
Calib. Verification	X	X	1	0.061	0.055	0.058	116
62-6021-1	10	<0.005	10	0.065	0.060	0.063	79
-12	10	<0.005	10	0.071	0.072	0.072	90
Final Calibration	X	X	X	X	X	X	X
Calib. Verification	X	X	1.0	0.059	0.053	0.056	112
Calib. Blank	X	X	1.0	0.001	0.001	<0.005	

LCS and Calibration Verification: American scientific True Value: 0.050 (ppm)

CRDL: 40 (ppb) Spike = 2 x CRDL

Comments:

Analyst Checked: EH Date: 8/7/86
 Q.C. Approved: EH Date: 7/3/86

007318

HGA Analytical Spikes

Element: V Procedure No. 3807220 Date: 6/26/86 Time 2:15 pm
 Wavelength: 318.4 nm BG 43D PE 5000 No. 82057 Analyst: EH
 Matrix Modifier: PE 603 No. 92034 I.O.L.: 0.005 (ppm)
 Water Soil Other _____ Page 1 of 1

Date Prepared: 6/26/86 STANDARDS (ppm) Prepared by: EH

	Initial	Recalibration	Final
Calibration Blank	0.000	0.000	
Standard 1	0.050 abs = 0.117	0.050	
Standard 2	0.100	0.100	
Standard 3: (0.070)	0.073 % = 104	0.071 % = 101	% =

Sample Number	Sample Dilution	Sample Conc. (ppm)	Dilution Factor	Reading 1	Reading 2	Avg. Conc. (ppm)	% Rec.
Initial Calib.	X	X	X	X	X	X	X
Calib. Verification	Y	Y	2	0.066	0.067	0.133	103
Calib. Blank	X	X	1	0.002	0.001	<0.005	
LCS	1.0	0.123	2	0.113	0.112	0.225	102
62-6041-1	1.0	<0.005	1	0.101	0.106	0.103	103
-1R	1.0	<0.005	1	0.100	0.101	0.100	100
-2	1.0	0.013	2	0.064	0.059	0.123	110
63-6043-1	1.0	<0.005	1	0.098	0.098	0.098	98
Calib. Blank	X	Y	1	0.003	0.002	<0.005	
Calib. Verification	X	X	2	0.068	0.069	0.137	106
63-6043-1R	1.0	<0.005	1	0.097	0.099	0.098	98
LCS	1.0	0.129	2	0.117	0.116	0.233	104
62-6043-2	1.0	0.026	2	0.063	0.063	0.126	100
-2R	1.0	0.029	2	0.062	0.060	0.122	93
-3	1.0	0.025	2	0.058	0.057	0.115	90
Recalibration	X	X	X	X	X	X	X
Calib. Verification	Y	Y	2	0.063	0.066	0.129	100
Calib. Blank	Y	Y	1	0.001	0.000	<0.005	
62-6043-4	1.0	0.021	2	0.058	0.057	0.115	94
-5	1.0	0.027	2	0.051	0.050	0.101	74
-6	1.0	0.025	2	0.049	0.049	0.098	73
-7	1.0	0.043	2	0.065	0.063	0.128	85
-8	1.0	0.040	2	0.062	0.059	0.121	81
Calib. Blank	X	Y	1	0.001	0.000	<0.005	
Calib. Verification	Y	Y	2	0.060	0.060	0.120	93
Final Calibration	X	X	X	X	X	X	X
Calib. Verification							
Calib. Blank							

LCS and Calibration Verification: 60PA 284-T 1/1 True Value: 0.129 (ppm)

CRDL: 50 (ppb) Spike = 2 x CRDL

Comments:

Analyst Checked: EH Date: 6/27/86
 Q.C. Approved: EH Date: 7/2/86

007319

QUALITY CONTROL REPORT NUMBER

F 7024 Rev. A

Number	Date In	Case No.	Number of Samples	Sample Custodian
49	3-10-86	5656	12	ch
50	3-18-86	5668	16	ch
51	3-26-86	2171 B (SAS)	18	ch
52	3/31/86	5668-soil	1	ch
53	4-5-86	5797	29	ch
54	4-11-86	5720 SAS 2015H	9	ch
55	4-14-86	5720 SAS 2015F	16 - 9 soils 7 waters	ch
56	4/29/86	5773	3 - 2 water 1 soil	et ch
57	5/24/86	5871 SAS 2014F	8 SAS 2014F	ch + EHA
58	5/28/86	2014F SAS	5	ch
59	5/29/86	2014F SAS	7	ch
60	5/30/86	2014 SAS	3	ch
61	5/31/86	2014 SAS	14 soils 2 waters	ch
62	6/6/86	2021	2 water	ch
63	6/6/86	26043	7 - soils 1 - 1 water	ch
64	7/2/86	6147	7 - soils 7 - H ₂ O	ch

007320

CASE LOG

Case Number: 6021

Date Received	QC Report Number	Number of Samples	ALR Designation	EPA Designation	Sample Custodian
6/6/86	62	2	62-6021-2-1 -2	MFC 272 MFC 274	ch

007321

62-6021-6-0033

F 7026

REPORTING SCHEDULE

Date Received	Number of Samples	QC Report No.	Case No.	Weekly Report (SMD)	Sample Traffic Report (SMD)	Data Package			Chain of Custody (NEIC)
						(SMD)	(CV)	(Region)	
5/31/86	16	61	2014F SAS	(34) 6/6/86	6/6/86 U.S. Mail EH				
6/6/86 Due 7/6/86	2	62	6021	(34) 6/6/86	6/6/86 U.S. Mail				
6/6/86 Due 7/6/86	8	63	6043	(34) 6/6/86	6/6/86 U.S. Mail				

007322

007323