PROJECT NAME: Morrisville Trailer Park
TDD NO.: F3-8704-77

EPA SITE NO.: PA 1749
REGION: III

ORIGINAL (Red)

SUPPORT DOCUMENTATION FOR THE REVIEW OF ORGANIC ANALYSIS LAB DATA PACKAGE

CASE/SAS NO.: 7352
TYPE OF ANALYSIS: Organic
CONTRACT LABORATORY: EA Engineering
APPLICABLE IFB OR SOW: 7/85
REVIEWER: Roy Cohen
REVIEW DATE: July 23, 1987

APPLICABLE SAMPLE NO's.: CJ 352-357, CJ 359-361 all aqueous

THE FOLLOWING TABLE INDICATES AREAS WHICH WERE EXAMINED IN DETAIL, THE IDENTIFIED PROBLEM AREAS, AND SUPPORT DOCUMENTATION ATTACHMENTS:

	AREAS EXAMINED IN DETAIL (CHECK (✓) IF YES OR FOOTNOTE LETTER FOR COMMENTS BELOW)				PROBLEM AREAS IDENTIFIED (CHECK (✓) IF YES OR FOOTNOTE NUMBER FOR COMMENTS BELOW)				SUPPORT DOCUMENTATION ATTACHMENTS (CHECK (✓) IF YES OR IDENTIFY ATTACHMENT NO.)			
	ALL APPLICABLE ANALYSES	VOA	BNA	PEST/PCB	ALL APPLICABLE ANALYSES	VOA	BNA	PEST/PCB	ALL APPLICABLE ANALYSES	VOA	BNA	PEST/PCB
HOLDING TIMES	✓						5				✓ F	
BLANK ANALYSIS RESULTS: TARGET COMPOUNDS	✓					1	1		✓ A			
BLANK ANALYSIS RESULTS: TENTATIVE I.D.s	✓								✓ B			
SURROGATE SPIKE RESULTS	✓						2		C			
MATRIX SPIKE RESULTS	✓						2		✓ D			
DUPLICATE ANALYSIS RESULTS	✓											
TARGET COMPOUND MATCHING QUALITY	✓					3			✓ (E → 1-3)			
TENTATIVELY IDENTIFIED COMPOUNDs	✓											
DFTPP & BFB SPECTRUM TUNE RESULTS	✓											
GC INSTRUMENT PERFORMANCE	✓											
INITIAL CALIBRATIONS	✓											
CONTINUING CALIBRATIONS	✓					4						
QUANTITATION OF RESULTS	✓											
OTHERS	✓											

COMMENTS: (1) Some target compounds detected in blanks.
(2) Acid-extractable surrogate and matrix spikes were not recovered out of two samples, even upon re-extracting. There may be a matrix interference here.

(3) Some low-level VOA ~~target~~ compounds (Chloroform, 1,1,1 Trichloroethane and dibromochloromethane) were identified as confident hits by the reviewer, and added to the data summary
(4) Continuing calibration response factor variances for acetone and Chloromethane out of allowable limit.
(5) Holding times for Base-Neutral re-extraction/analyses exceeded holding times.

BLANK ANALYSIS RESULTS FOR TARGET COMPOUNDS (A)

RACTION	TYPE	CONC	MATRIX	SAMPLE #	SOURCE OF H_2O	CONTAMINANTS (CONCENTRATION / DETECTION LIMIT)
10A	Low water method Blank			HP 27376	LAB	Methylene Chloride 4 ug/L
VOA	Low water field Blank			CJ361	NUS	Methylene Chloride 26 ug/L acetone 20 ug/L
3NA	Low Water LAB (method) Blank			AA 02746	LAB	Bis(2-ethyl hexyl)phthalate 13 ug/L
NA	low water field Blank			CJ361	NUS	None detected
ES	low water lab and field Blanks					None detected

ORIGINAL (Red)

ABORATORY REPORTED FIELD BLANK DATA IS COMPARED WITH THE SAMPLE DATA IN A TABULATION FORM WITHIN THE AMPLE ANALYTICAL DATA SUMMARY. TENTATIVELY IDENTIFIED COMPOUNDS IN BLANKS ARE LISTED ON A SEPARATE FORM

OMMENTS:

(1) RESULT REPORTED BY LABORATORY AND CONFIRMED BY REVIEWER.

(2) RESULT INFERRED FROM QUANTITATION LIST, DIAGNOSTICS, CHROMATOGRAM AND/OR SPECTRA.

BLANK ANALYSIS RESULTS FOR TENTATIVELY IDENTIFIED COMPOUNDS

ORIGINAL (Red) B

ALL TENTATIVELY IDENTIFIED COMPOUNDS FOUND IN BLANK ANALYSES ARE LISTED BELOW:

SAMPLE #	FRACTION	SCAN #(S) OR R.T	ESTIMATED CONCENTRATION	COMPOUND NAME	COMMENTS
HP 27372	VOA	42	1 ug/L	NLS	
AA02723	BNA	701	4 ug/L	NLS	
	"	721	15 ug/L	Sulfuric Acid, diethyl ester	
AA02746	BNA	560	3 ug/L	NLS	
↓	↓	725	29 ug/L	Sulfuric Acid, diethyl ester	
		2284	7 ug/L	phthalate	
		2334	3 ug/L	NLS	
CJ 361	VOA	315	1 ug/L	NLS	
↓	"	553	4 ug/L	NLS	
	BNA	702	8 ug/L	siloxane compound	

ORIGINAL (Red)

WATER SURROGATE PERCENT RECOVERY SUMMARY

Case No. 7352 Contract Laboratory EA ENGINEERING Contract No. 68-01-7099

SMO TRAFFIC NO.	VOLATILE: TOLUENE-D8 (88-110)	VOLATILE: BFB (86-115)	VOLATILE: 1,2 DICHLORO-ETHANE-D4 (76-114)	SEMI-VOLATILE: NITRO-BENZENE-D5 (35-114)	SEMI-VOLATILE: 2-FLUORO-BIPHENYL (43-116)	SEMI-VOLATILE: TERPHENYL-D14 (33-141)			SEMI-VOLATILE: PHENOL-D5 (10-94)	SEMI-VOLATILE: 2-FLUORO-PHENOL (21-100)	SEMI-VOLATILE: 2,4,6 TRIBROMO PHENOL (10-123)	PESTICIDE: ** DIBUTYL-CHLORENDATE (24-154)	
CJ 352	102	106	110	—	—	—			—	—	—	78.2	
CJ 353	102	106	106	—	—	—			—	—	—	79.1	
CJ 354	102	106	100	—	—	—			—	—	—	94.0	
CJ 355	102	88	104	—	—	—			—	—	—	62.6	
CJ 356	102	106	102	—	—	—			—	—	—	53.7	
CJ 357	104	90	90	—	—	—			—	—	—	56.7	
CJ 361	106	110	78	—	—	—			—	—	—	69.9	
Method Blank	100	106	86	—	—	—			—	—	—	107.5	
CJ 352 MS	—	—	—	—	—	—			—	—	—	80.2	
CJ 352 MSD	—	—	—	—	—	—			—	—	—	81.8	
CJ-359	104	106	104	—	—	—			—	—	—	—	
CJ-360	104	110	102	—	—	—			—	—	—	—	
CJ-357 MS	100	100	106	—	—	—			—	—	—	—	
CJ-357 MSD	100	102	110	—	—	—			—	—	—	—	
Blank Re-Re	—	—	—	76	79	102			37	57	91	—	
+ CJ 353 Re-Re	—	—	—	70	80	94			3*	5*	60	—	353
- CJ 356 Re-Re	—	—	—	78	87	111			23	39	112	—	
Blank RE	—	—	—	75	71	120			35	47	104	—	
CJ 352 RE	—	—	—	55	66	107			16	29	93	—	
✓ CJ 353 RE	—	—	—	64	73	116			0*	0*	22	—	353
CJ 354 RE	—	—	—	68	71	79			0*	0*	1*	—	354
CJ 354 MS-RE	—	—	—	76	78	115			0*	0*	1*	—	354 (MS)
CJ 354 MSD-RE	—	—	—	73	71	113			0*	0*	1*	—	354 (MSD)
CJ 355 RE	—	—	—	72	75	123			23	40	139*	—	
CJ 357 RE	—	—	—	70	70	97			23	35	93	—	

* VALUES ARE OUTSIDE OF CONTRACT REQUIRED QC LIMITS

** ADVISORY LIMITS ONLY

Volatiles: 0 out of 36 ; outside of QC limits

Semi-Volatiles: 14 out of 66 ; outside of QC limits

Pesticides: 0 out of 10 ; outside of QC limits

Comments: + These results are for the second re-extraction & reanalysis of this sample; the prior A/P surrogate recoveries are similar to those in the previous run WMA 7/9/87

2 001

FORM II 7/85

ORIGINAL (RED)

WATER SURROGATE PERCENT RECOVERY SUMMARY

Case No. 7352 Contract Laboratory EA Engineering Contract No. 68-01-7099

	VOLATILE			SEMI-VOLATILE								PESTICIDE
SMO TRAFFIC NO.	TOLUENE-D8 (88-110)	BFB (86-115)	1,2 DICHLORO-ETHANE-D4 (76-114)	NITRO-BENZENE-D5 (35-114)	2-FLUORO-BIPHENYL (43-116)	TERPHENYL-D14 (33-141)			PHENOL-D5 (10-94)	2-FLUORO-PHENOL (21-100)	2,4,6 TRIBROMO PHENOL (10-123)	** DIBUTYL-CHLORENDATE (24-154)
CJ361RE	—	—	—	77	87	88			25	39	100	—

2 * VALUES ARE OUTSIDE OF CONTRACT REQUIRED QC LIMITS

** ADVISORY LIMITS ONLY

Volatiles: NA out of — ; outside of QC limits

Semi-Volatiles: 0 out of 6 ; outside of QC limits

Pesticides: NA out of — ; outside of QC limits

002

Comments:

FORM II

7/85

ORIGINAL (Red)

WATER MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Case No. 7352 Contractor EA ENGINEERING Contract No. 68-01-7099

FRACTION	COMPOUND	CONC. SPIKE ADDED (ug/L)	SAMPLE RESULT	CONC. MS	% REC	CONC. MSD	% REC	RPD	QC LIMITS* RPD	QC LIMITS* RECOVERY
VOA SMO SAMPLE NO. CJ357	1,1-Dichloroethene	50	0	23	46*	23	46*	0	14	61-145
	Trichloroethene	50	0	48	96	49	98	-2	14	71-120
	Chlorobenzene	50	0	55	110	57	114	-4	13	76-130
	Toluene	50	0	52	104	53	106	-2	13	76-125
	Benzene	50	0	47	94	48	96	-2	11	76-127
B/N SMO SAMPLE NO. CJ354	1,2,4-Trichlorobenzene	100	0	73	73	70	70	4	28	39-98
	Acenaphthene	100	0	72	72	64	64	12	31	46-118
	2,4 Dinitrotoluene	100	0	60	60	54	54	11	38	24-96
	Pyrene	100	0	110	110	98	98	12	31	26-127
	N-Nitroso-Di-n-Propylamine	100	0	75	75	69	69	8	38	41-116
	1,4-Dichlorobenzene	100	0	66	66	65	65	2	28	36-97
ACID SMO SAMPLE NO. CJ354	Pentachlorophenol	200	0	8	4*	8	4*	0	50	9-103
	Phenol	200	0	0	0*	0	0*	0*	42	12-89
	2-Chlorophenol	200	0	0	0*	0	0*	0*	40	27-123
	4-Chloro-3-Methylphenol	200	0	0	0*	0	0*	0*	42	23-97
	4-Nitrophenol	200	0	8	4*	9	4.5*	12	50	10-80
PEST SMO SAMPLE NO. CJ352	Lindane	0.2	0.0	0.16	79.6	0.16	79.4	0.3	15	56-123
	Heptachlor	0.2	0.0	0.12	60.6	0.12	60.6	0.00	20	40-131
	Aldrin	0.2	0.0	0.14	70.0	0.14	70.0	0.00	22	40-120
	Dieldrin	0.5	0.0	0.42	84.4	0.43	86.0	1.9	18	52-126
	Endrin	0.5	0.0	0.45	90.3	0.45	90.0	0.03	21	56-121
	4,4'-DDT	0.5	0.0	0.60	119.4	0.60	120.0	0.50	27	38-127

*ASTERISKED VALUES ARE OUTSIDE QC LIMITS.

RPD: VOAs 0 out of 5; outside QC limits
B/N 0 out of 6; outside QC limits
ACID 3 out of 5; outside QC limits
PEST 0 out of 6; outside QC limits

RECOVERY: VOAs 2 out of 10; outside QC limits
B/N 0 out of 12; outside QC limits
ACID 10 out of 10; outside QC limits
PEST 0 out of 12 outside QC limits

Comments: Poor acid matrix spike recoveries were seen in both samples. Very poor acid/phenol surrogate recoveries seen in original sample & MS, MSD. Thought to be due to matrix effect. WMA 7/9/87

2 003

ORIGINAL (Red)

METHOD BLANK SUMMARY

Case No. 7352 Region III Contractor EA Engineering Contract No. 68-01-7099

FILE ID	DATE OF ANALYSIS	FRACTION	MATRIX	CONC. LEVEL	INST. ID	CAS NUMBER	COMPOUND (HSL, TIC OR UNKNOWN)	CONC.	UNITS	CRDL
AA02723#721	7/7/87	BNA	WATER	LOW	MS #2	64-67-5	SULFURIC ACID, Diethyl Ester	15	ug/l	—
AA02746 #2150	7/9/87	BNA	water	Low	MS#2	117-81-7	bis (2-ethylhexyl) phthalate	13	ug/l	10
#718	↓	↓	↓	↓	↓	64-67-5	Sulfuric acid, Diethyl ester	29	↓	—

Comments:

2 004

7/85

FORM IV

METHOD BLANK SUMMARY

Case No. 7352 Region _____ Contractor EA ENGINEERING Contract No. 68-01-7099

FILE ID	DATE OF ANALYSIS	FRACTION	MATRIX	CONC. LEVEL	INST. ID	CAS NUMBER	COMPOUND (HSL, TIC OR UNKNOWN)	CONC.	UNITS	CRDL
HP 27376	6-3-87	VOA	WATER	LOW	GC/MS #1	75-09-2	Methylene Chloride	4	ug/L	5
Method BLK.	6-26-7	Pest.	Water	LOW	GC-3B	—	Unknowns (rt. 2.14, 3.69, 18.81)	—	—	—

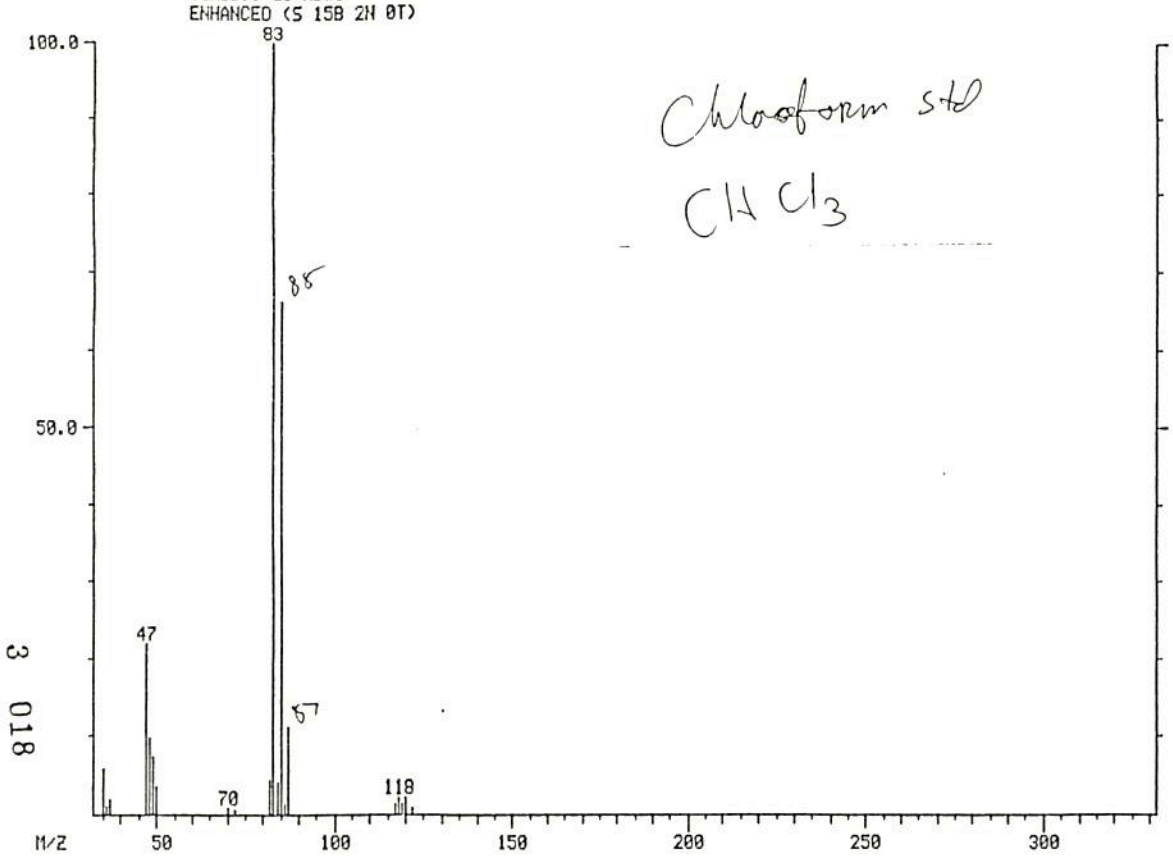
Comments:

2 005

06/03/87 0:00:00 + 10:30
SAMPLE: VOLATILES STD #585 50PPB 5ML 6-3-87 9:55 DMW
CONDS.: GC/MS#1
ENHANCED (S 15B 2N 0T)

RIC: 11600.

E1



ORIGINAL (Red)

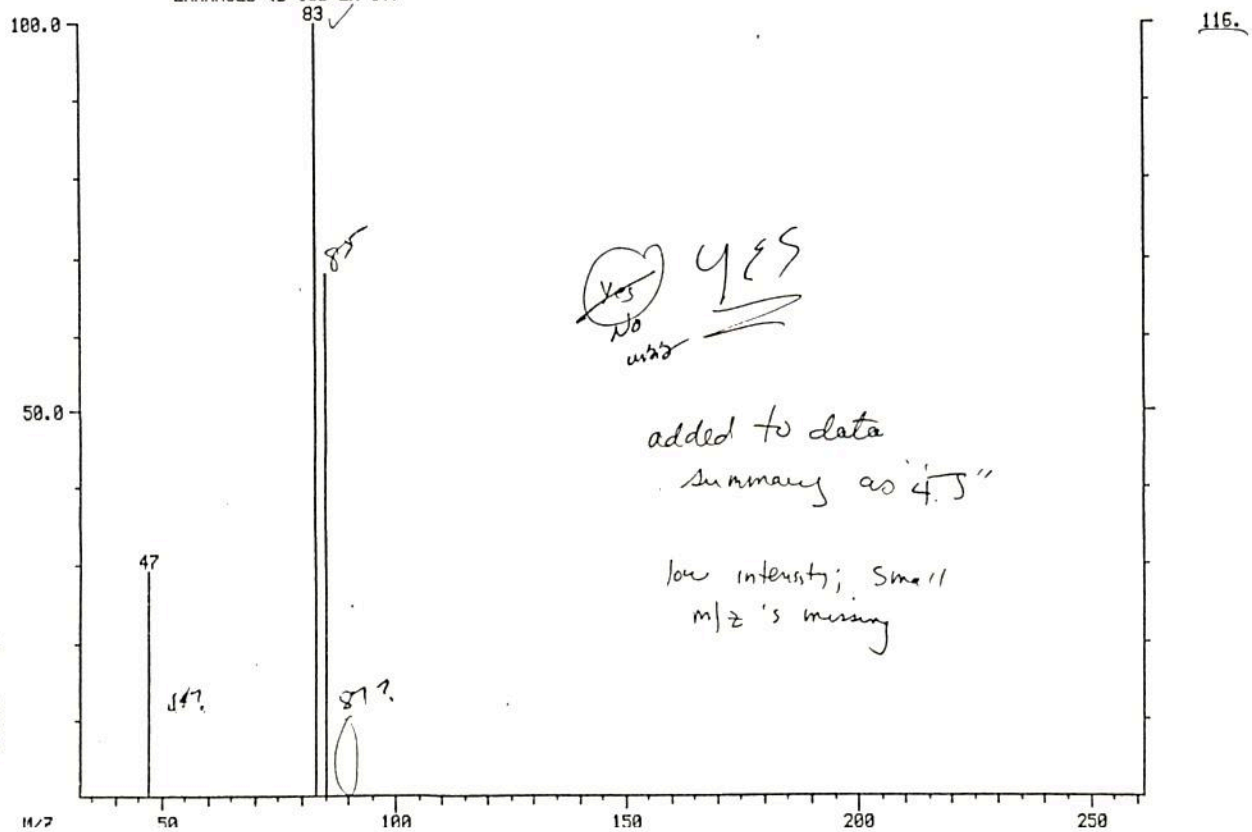
Chloroform std
$CHCl_3$

3 018

MASS SPECTRUM
06/03/87 0:00:00 + 10:32
SAMPLE: VOA H2O EPA#CJ352 EA#4035 5ML CASE:7352 6-3-87 12:07 DMW
CONDS.: GC/MS#1
ENHANCED (S 15B 2N 0T)

DATA: HP27375 #311

BASE M/Z: 83
RIC: 229.



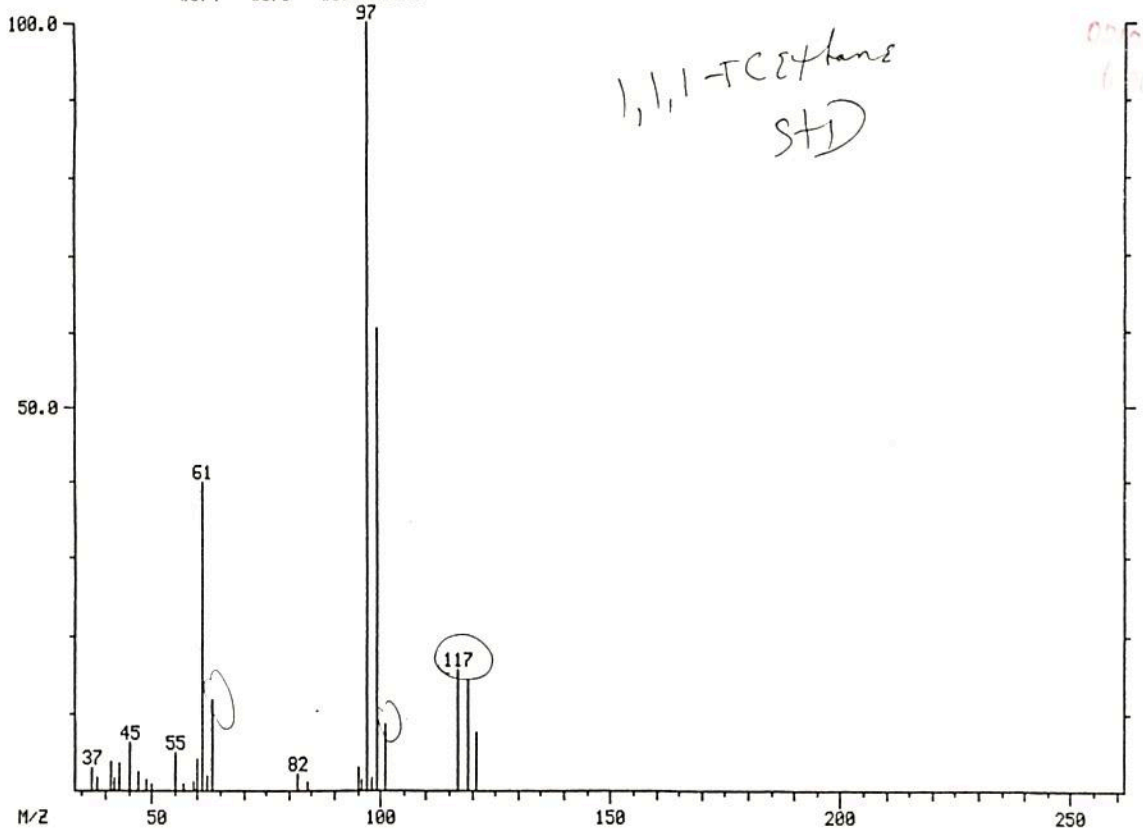
~~Yes~~ No YES

added to data summary as "4.5"

low intensity; small m/z's missing

3 017

SAMPLE: VOLATILES STD #585 50PPB 5ML 6-3-87 9:55 DMW
CONDS.: GC/MS#1
#374 - #373 - #373 X1.00



1,1,1-TCEthane
STD

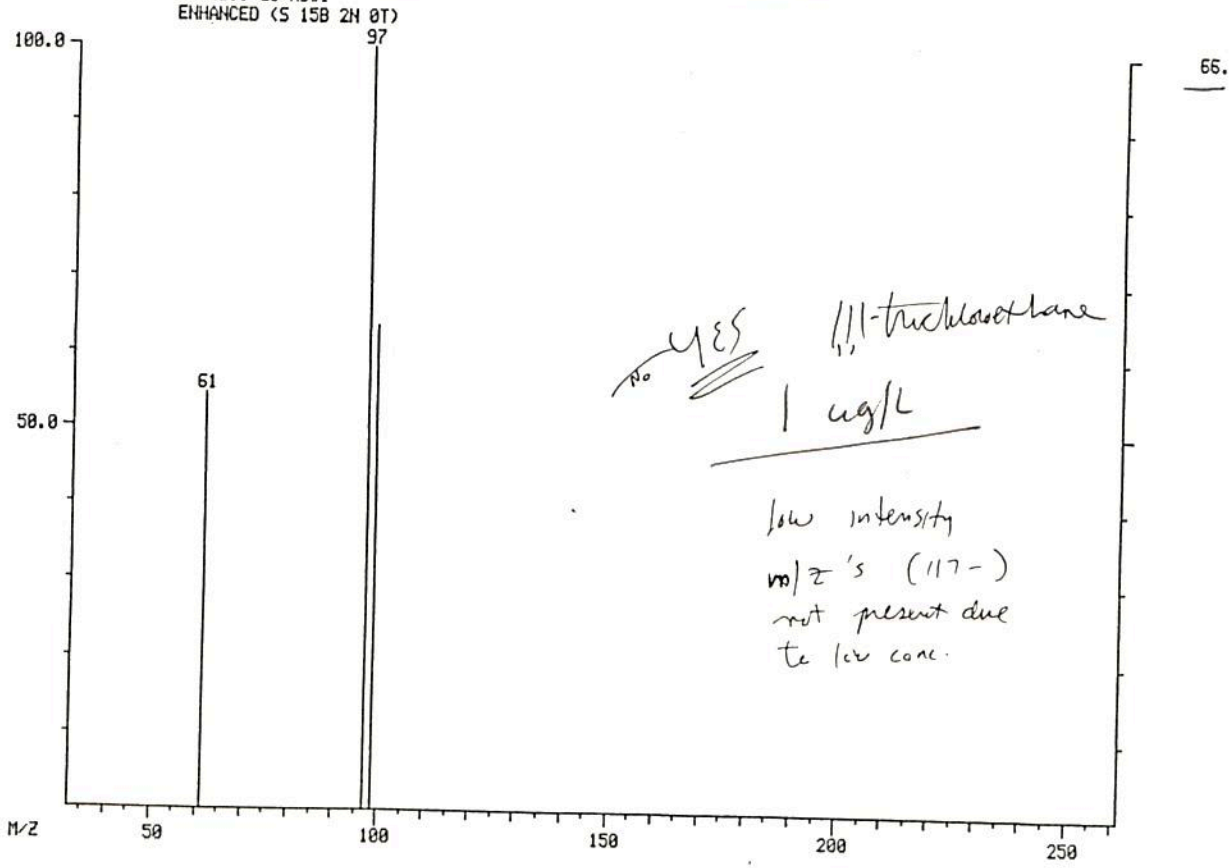
E_2

3 154

MASS SPECTRUM
06/03/87 0:00:00 + ~~12:48~~
SAMPLE: VOA H2O EPA#CJ355 EA#4038 5ML CASE:7352 6-3-87 15:46 DMW
CONDS.: GC/MS#1
ENHANCED (S 15B 2N 0T)

DATA: HP27379 #378

BASE M/Z: 97
RIC: 144.



No YES 1,1,1-trichloroethane
1 ug/L

low intensity m/z's (117-) not present due to low conc.

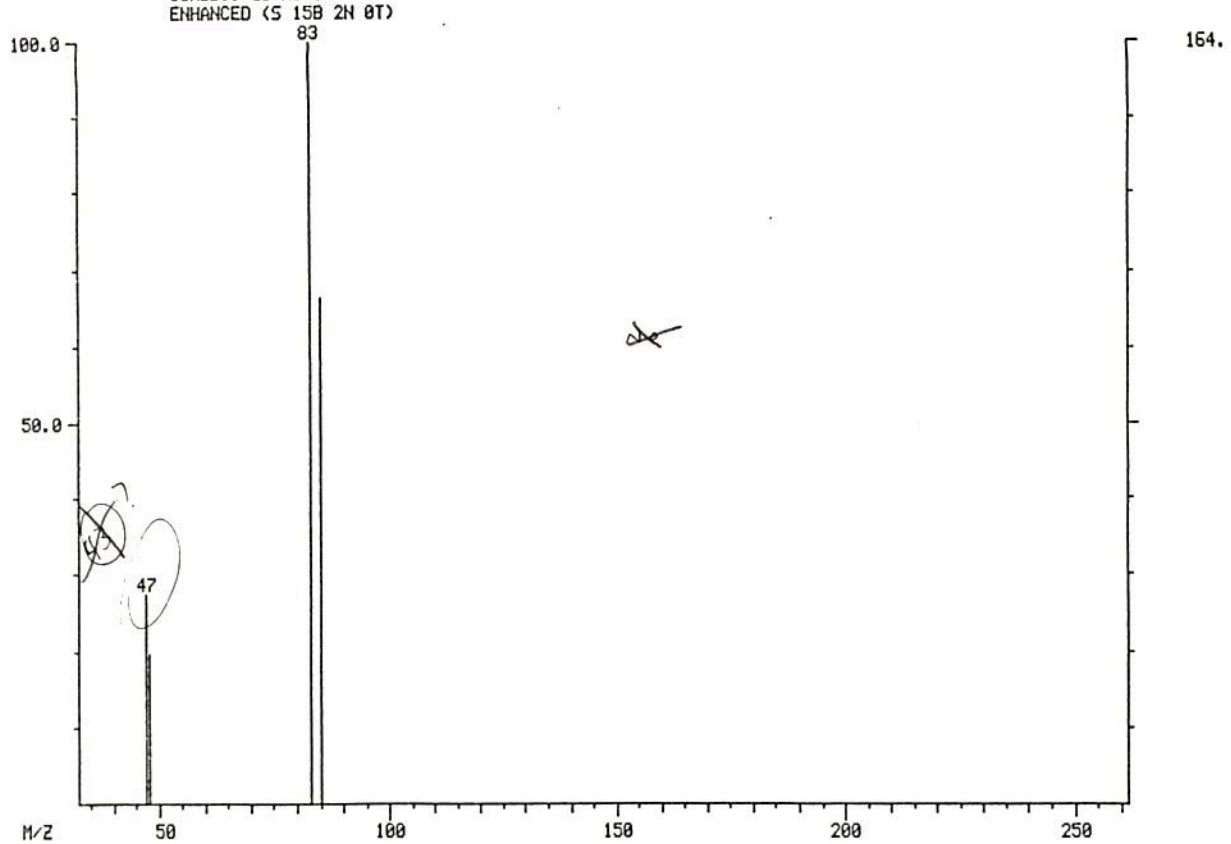
3 153

MASS SPECTRUM
06/03/87 0:00:00 + 13:49
SAMPLE: VOA H2O EPA#CJ359 EA#4042 5ML CASE:7352 6-3-87 19:06 DMW
CONDS.: GC/MS#1
ENHANCED (S 15B 2N 0T)

DATA: HP27383 #408

BASE M/Z: 83
RIC: 350.

ORIGINAL (Red) 3

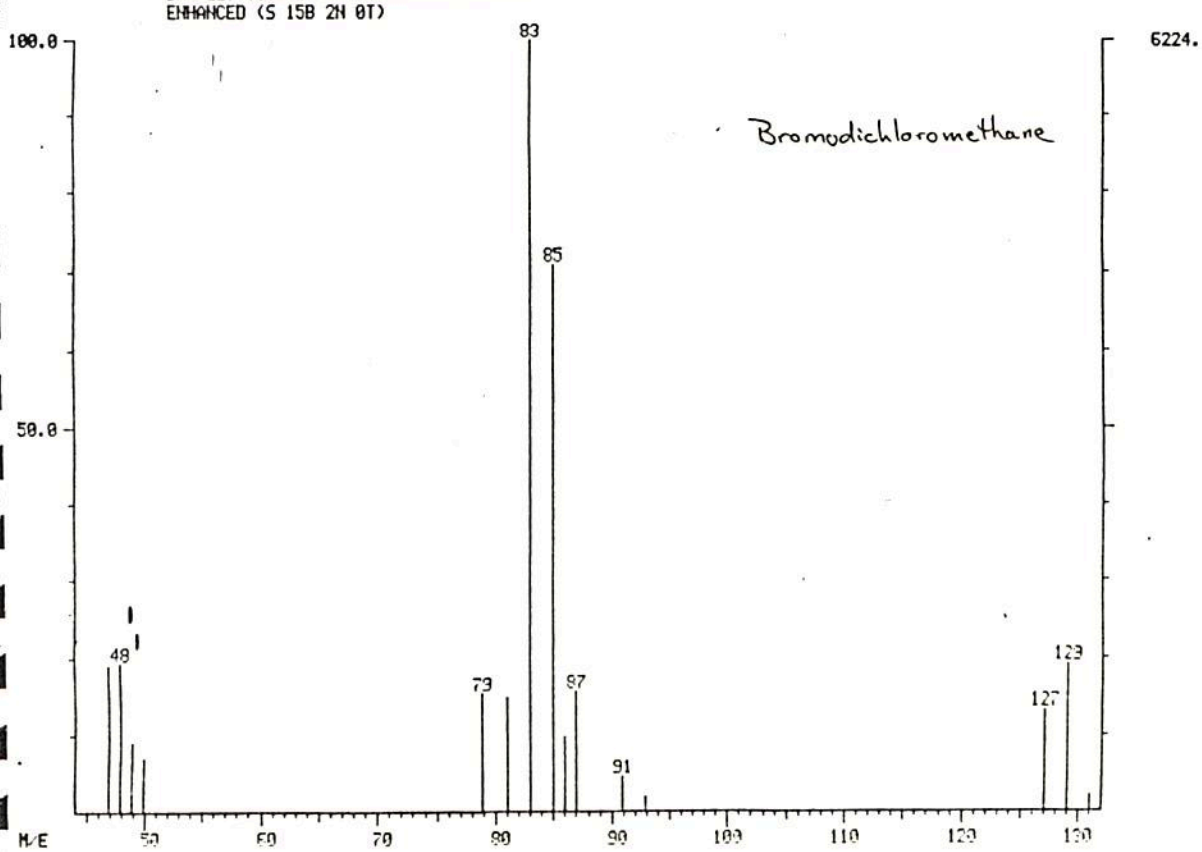


2172

MASS SPECTRUM
03/07/84 6:32:00 + 8:12
SAMPLE: 50UG/L VOA SCREENING STANDARD
ENHANCED (S 15B 2N 0T)

DATA: VOA465 #164
CALI: FF030584 #1

BASE M/E: 83
RIC: 25152.



Bromodichloromethane

from files

F

BNA SAMPLE, BLANK AND STANDARD LOG

SAMPLE ID	LAB ID	DATE ANALYZED	TIME ANALYZED	INST ID
50PPM STD	AA02706	07/02/87	14:28:00	MS2
160PPM STD	AA02707	07/02/87	18:06:00	MS2
120PPM STD	AA02708	07/02/87	18:57:00	MS2
80PPM STD	AA02709	07/02/87	19:47:00	MS2
20PPM STD	AA02710	07/02/87	20:37:00	MS2
50 PPM BNA STD	AA02722	07/07/87	16:24:00	MS2
LOW H20 BLANK(RE)	AA02723	07/07/87	17:55:00	MS2
CJ352RE	AA02724	07/07/87	18:48:00	MS2
CJ353RE	AA02725	07/07/87	19:39:00	MS2
CJ354RE	AA02726	07/07/87	20:29:00	MS2
CJ354MSRE	AA02727	07/07/87	21:19:00	MS2
CJ354MSDRE	AA02728	07/07/87	22:09:00	MS2
CJ355RE	AA02729	07/07/87	22:59:00	MS2
50 PPM BNA STD	AA02732	07/08/87	9:25:00	MS2
CJ357RE	AA02733	07/08/87	11:09:00	MS2
J361RE	AA02734	07/08/87	11:59:00	MS2
50PPM STD	AA02745	07/09/87	12:44:00	MS2
LOW H20 BLANK(RE-RE)	AA02746	07/09/87	14:17:00	MS2
CJ353(RE-RE)	AA02747	07/09/87	15:09:00	MS2
CJ356(RE-RE)	AA02748	07/09/87	16:04:00	MS2

FORM V

Samples taken on 5/28/87

5/28 → 7/02 is 35 days

Samples were re-extracted on July 6 (from form I's). This is 39 days after sampling.

PROJECT NAME: Morrisville Tracer PK
TDD NO.: F3-8704-77

EPA SITE NO.: PA1177
REGION: III

SUPPORT DOCUMENTATION FOR THE REVIEW OF INORGANIC ANALYTICAL DATA PACKAGE

ORIGINAL (Red)

CASE/SAS NO.: 7352
TYPE OF ANALYSIS: metals and CN
CONTRACT LABORATORY: Mack Labs
APPLICABLE IFB OR SOW: 7/85
REVIEWER: Roy Cohen
REVIEW DATE: Aug 26, 1987

APPLICABLE SAMPLE NO's.: MCK 352 – 357, MCK 361, MCK 363, MCK 364

THE FOLLOWING TABLE INDICATES AREAS WHICH WERE EXAMINED IN DETAIL, THE IDENTIFIED PROBLEM AREAS, AND SUPPORT DOCUMENTATION ATTACHMENTS:

	AREAS EXAMINED IN DETAIL — CHECK (✓) IF YES OR FOOTNOTE LETTER FOR COMMENTS BELOW					PROBLEM AREAS IDENTIFIED — CHECK (✓) IF YES OR FOOTNOTE NUMBER FOR COMMENTS BELOW					SUPPORT DOCUMENTATION ATTACHMENTS — CHECK (✓) IF YES OR IDENTIFY ATTACHMENT NO.				
	ALL APPLICABLE ANALYSES	ICP OR A.A. METALS	FURNACE METALS	COLD VAPOR MERCURY	CYANIDE	ALL APPLICABLE ANALYSES	ICP OR A.A. METALS	FURNACE METALS	COLD VAPOR MERCURY	CYANIDE	ALL APPLICABLE ANALYSES	ICP OR A.A. METALS	FURNACE METALS	COLD VAPOR MERCURY	CYANIDE
HOLDING TIMES	✓								(1)					✓F	
BLANK ANALYSIS RESULTS	✓					(2)					✓A				
MATRIX SPIKES (PRE-DIGESTION)	✓					(3)					✓B				
DUPLICATES	✓					(5)					✓C				
QUANTITATION OF RESULTS	✓						(4)					✓D			
DETECTION LIMITS/SENSITIVITY	✓							(6)				✓E			
INITIAL CALIBRATIONS	✓														
CONTINUING CALIBRATIONS	✓														
LABORATORY CONTROL STANDARDS	✓														
ICP LINEAR RANGE ANALYSIS	✓						(8)								
ICP INTERFERENCE CHECKS	✓														
ICP SERIAL DILUTIONS	✓														
GFAA POST-DIGESTION SPIKES	✓														
GFAA DUPLICATE BURNS	✓														
GFAA STANDARD ADDITIONS	✓							(7)				✓G			
OTHERS field duplicates	✓						(9)								

COMMENTS: (1) Holding time exceeded for Mercury analysis
(2) Several metals detected in blanks
(3) Spike recoveries out of range for three metals
(4) Lab misreported two results; reviewer recalculated two results
(5) High % difference in lab duplicate results for Lead and Zinc
(6) Detection capability for Selenium questionable – d.L may be 6 ug/l
(7) Several standard addition correlation coefficients < .995
(8) No linear range analysis performed for ICP (3 stds were run, though)
(9) Al, Ag, Cu, Fe results not precise for field duplicate samples

BLANK ANALYSIS RESULTS

TASK	TYPE	CONC	MATRIX	SAMPLE #	SOURCE OF H_2O	CONTAMINANTS (CONCENTRATION / DETECTION LIMIT)
Metals	Low water prep. blank				Lab	Iron 40 ug/l Zinc 17 ug/l Selenium 4 ug/l
metals	Low water Calibration blanks				Lab	Barium 10 ug/l Manganese 14 ug/l Mercury .2 ug/l Selenium 4 ug/l Lead 4.8 ug/l
metals	Low Water field Blank			MCK 361	NUS	Aluminum 90 ug/l Cadmium 5 ug/l Chromium 9 ug/l Cobalt 60 ug/l Iron 60 ug/l Manganese 24 ug/l Selenium 4 ug/l Sodium 7300 ug/l Zinc 17 ug/l

LABORATORY REPORTED FIELD BLANK DATA IS COMPARED WITH THE SAMPLE DATA IN A TABULATION FORM WITHI SAMPLE ANALYTICAL DATA SUMMARY.

COMMENTS:

(1) RESULT REPORTED BY LABORATORY AND CONFIRMED BY REVIEWER.

(2) RESULT INFERRED FROM RAW DATA

ORIGINAL (Red)

A

Form III - A

Q. C. Report No.: 3000/44

BLANKS

LAB NAME: Mack Laboratories CASE NO.: 7352

DATE: August 18, 1987 UNITS: ug/L

Matrix: WATER

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum	110 U	110 U	110 U	110 U		110 U	
2. Antimony	40 U	40 U	40 U	40 U	40 U	40 U	
3. Arsenic	4 U	4 U	4 U	4 U	4 U		
4. Barium	[10]	10 U	10 U	[10]		[10]	
5. Beryllium	1 U	1 U	1 U	1 U		1 U	
6. Cadmium	5 U	5 U	5 U	5 U		5	
7. Calcium	800 U	800 U	800 U	800 U		800 U	
8. Chromium	7 U	7 U	7 U	7 U		7 U	
9. Cobalt	20 U	20 U	20 U	20 U		20 U	
10. Copper	10 U	10 U	10 U	10 U		10 U	
11. Iron	40 U	40 U	40 U	40 U		[40]	
12. Lead	4 U	4 U	4 U	4 U	4 U	4 U	
13. Magnesium	700 U	700 U	700 U	700 U		700 U	
14. Manganese	[14]	6 U	6 U	6 U		6 U	
15. Mercury	0.2	0.2	0.2 U			0.2 U	
16. Nickel	30 U	30 U	30 U	30 U	30 U	30 U	
17. Potassium	3,000 U	3,000 U	3,000 U	3,000 U	3,000 U	3,000 U	
18. Selenium	4 U	4 U	4 U	4 U	4 U		
19. Silver	9 U	9 U					
20. Sodium	1,200 U	1,200 U	1,200 U				
21. Thallium	9 U	9 U	9 U	9 U	9 U		
22. Tin	20 U	20 U	20 U	20 U	20 U	20 U	
23. Vanadium	40 U	40 U					
24. Zinc	13 U	13 U	13 U	13 U		[15]	
Other							
Cyanide	2 U	2 U	2 U			2 U	

ORIGINAL (Red)

A

Form III - B

Q. C. Report No.: 3000/44

BLANKS

LAB NAME: Mack Laboratories

CASE NO.: 7352

DATE: August 18, 1987

UNITS: ug/L

Matrix: WATER

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

ORIGINAL (Red)

Form III - C

Q. C. Report No.: 3000/44

BLANKS

LAB NAME: Mack Laboratories CASE NO.: 7352

DATE: August 18, 1987 UNITS: ug/L

Matrix: WATER

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium							
5. Beryllium							
6. Cadmium							
7. Calcium	800 U	800 U					
8. Chromium							
9. Cobalt							
10. Copper							
11. Iron	40 U	40 U	40 U				
12. Lead	[4.8]	[4.8]	4 U	[4.8]	4 U		
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver	9 U	9 U				9 U	
20. Sodium	1,200 U	1,200 U				1,200 U	
21. Thallium							
22. Tin							
23. Vanadium	40 U	40 U				40 U	
24. Zinc	13 U	13 U	13 U				
Other							
Cyanide							

ORIGINAL (Red)

Form V

Q. C. Report No.: 3000/44

SPIKE SAMPLE RECOVERY

LAB NAME: Mack Laboratories

DATE: August 18, 1987

CASE NO.: 7352
EPA Sample No.: MCK 357
Lab Sample ID No.: 3000/578
Units: ug/l

Matrix: Water

Compound	Control Limit % R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	% R[1]
Metals:					
1. Aluminum	75-125	1,850	110 U	2,000	92
2. Antimony	"	590	40 U	500	118
3. Arsenic	"	21	4 U	20	105
4. Barium	"	1,650	[70]	2,000	79
5. Beryllium	"	47	1 U	50	94
6. Cadmium	"	43	5 U	50	86
7. Calcium	"	116,000	20,600	100,000	95
8. Chromium	"	143	10	200	66R
9. Cobalt	"	390	20 U	500	78
10. Copper	"	244	[12]	250	93
11. Iron	"	1,880	1,490	1,000	39R
12. Lead	"	18	4 U	20	90
13. Magnesium	"	50,100	[3,300]	50,000	94
14. Manganese	"	271	82	200	94
15. Mercury	"	0.93	2.2	1	~~127R~~ 10
16. Nickel	"	380	30 U	400	95
17. Potassium	"	55,300	5,400	50,000	98
18. Selenium	"	15	20 U	10	150R
19. Silver	"	50	17	50	66R
20. Sodium	"	116,000	6,840	100,000	109
21. Thallium	"	47 s	9 U	50	94
22. Tin	"	390	20 U	400	98
23. Vanadium	"	490	40 U	500	98
24. Zinc	"	194	38	200	78
Other:					
Cyanide	"	106	2 U	100	106

1 % R = [(SSR - SR)/SA] x 100

"R" - Out of control

NF - "R" flag is not required for spike recovery results outside of the control limits (75-125) since the sample concentration is greater than four times the spike concentration.

ORIGINAL (Red)

Form VI

Q. C. Report No.: 3000/44

DUPLICATES

LAB NAME: Mack Laboratories

DATE: August 18, 1987

CASE NO.: 7352
EPA Sample No.: MCK 355
Lab Sample ID No.: 3000/576
Units: ug/l

Matrix: Water

Compound	Control Limit [1]	Sample (S)	Duplicate (D)	RPD [2]
Metals:				
1. Aluminum	NC	110 U	110 U	NC
2. Antimony	NC	40 U	40 U	NC
3. Arsenic	NC	4 U	4 U	NC
4. Barium	NC	[80]	[80]	NC
5. Beryllium	NC	1 U	1 U	NC
6. Cadmium	NC	5 U	5	NC
7. Calcium	20	24,700	28,100	13
8. Chromium	NC	7 U	7 U	NC
9. Cobalt	NC	20 U	20 U	NC
10. Copper	+-CRDL	69	59	16
11. Iron	NC	[90]	[50]	NC
12. Lead	+-CRDL	5 s	16	105 *
13. Magnesium	+-CRDL	15,000	14,500	3
14. Manganese	NC	[13]	[13]	NC
15. Mercury	NC	0.20	0.2 U	NC
16. Nickel	NC	30 U	30 U	NC
17. Potassium	NC	[4,140]	[4,040]	NC
18. Selenium	NC	[4]	4 U	NC
19. Silver	NC	9 U	9 U	NC
20. Sodium	20	45,400	45,600	< 1
21. Thallium	NC	45 U	9 U	NC
22. Tin	NC	20 U	20 U	NC
23. Vanadium	NC	40 U	40 U	NC
24. Zinc	+-CRDL	39	20	64
Other:				
Cyanide	NC	2 U	2 U	NC

* Out of Control

[1] To be added at a later date

[2] RPD = [|S - D|/((S + D)/2)] x 100

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

ORIGINAL (Red)

	FE238		-0.00					
	CR205	AV	0.005	SD	0.0054	CV 102.0	7U	mg/L
	ZN213	AV	0.000	SD	0.0058	CV>999.0	13U	3000/577
	CD214	AV	0.002	SD	0.0021	CV 130.2	5U	
	PB220	AV	-0.00	SD	0.084	CV>999.0	40U	
	CO228	AV	0.01	SD	0.008	CV 79.6	20U	
	NI231	AV	0.01	SD	0.017	CV 223.0	30U	
	BA233	AV	0.00	SD	0.011	CV>999.0	10U	
	FE238	AV	-0.00	SD	0.004	CV 111.2	40U	

000/575	REPLICATE 1		
	CR205	0.007	
	ZN213	0.035	3000/577
	CD214	0.009	
	PB220	0.05	
	CO228	0.01	
	NI231	0.02 ✓	Reviewed 8/13/87
	BA233	0.05	
	FE238	0.28	
000/575	REPLICATE 2		
	CR205	0.004	
	ZN213	0.044	
	CD214	0.006	
	PB220	0.04	
	CO228	0.02	
	NI231	0.04 ✓	
	BA233	0.05	
	FE238	0.25	
3000/575	REPLICATE 3		3000/578
	CR205	0.006	
	ZN213	0.048	
	CD214	0.004	PEAK OFFSET
	PB220	0.07	
	CO228	0.02	
	NI231	0.06 ✓	
	BA233	0.04	
	FE238	0.21	
3000/575	REPLICATE 4		3000/578
	CR205	-0.000	
	ZN213	0.041	
	CD214	0.004	
	PB220	0.02	
	CO228	-0.02	PEAK OFFSET
	NI231	0.03 ✓	
	BA233	0.05	
	FE238	0.22	

38 4/50 12/30

MCK 354

	CR205	AV	0.004	SD	0.0032	CV 72.5	7U	mg/L
	ZN213	AV	0.042	SD	0.0054	CV 12.9	42	3000/578
MCK 354	CD214	AV	0.006	SD	0.0024	CV 42.4	6	
	PB220	AV	0.05	SD	0.020	CV 44.0	50	
	CO228	AV	0.01	SD	0.016	CV 263.0	20U	didn't report?
	NI231	AV	0.04	SD	0.019	CV 50.4	40	
	BA233	AV	0.05	SD	0.003	CV 5.9	50	
	FE238	AV	0.24	SD	0.032	CV 13.3	240	

3000/576	REPLICATE 1		
	CR205	0.007	
	ZN213	0.042	3000/578

CU324 0.041

3000/580 REPLICATE 4

MG293	8.1
MN294	0.047
AL308	1.45
BE313	-0.002
CA317	41.49
CU324	0.051

PEAK OFFSET

ORIGINAL (Red)

MCK 364

MG293	AV	8.0	SD	0.17	CV	2.1	8000	1k
MN294	AV	0.050	SD	0.0155	CV	30.9	50	
AL308	AV	1.49	SD	0.078	CV	5.3	1,490	
BE313	AV	-0.003	SD	0.0002	CV	9.0		
CA317	AV	40.82	SD	0.579	CV	1.4	40800	
CU324	AV	0.048	SD	0.0049	CV	10.3	48	

3000/581 REPLICATE 1

MG293	0.3
MN294	0.032
AL308	0.11
BE313	-0.003
CA317	0.07
CU324	0.012

361 110

PEAK OFFSET

3000/581 REPLICATE 2

MG293	0.3
MN294	0.005
AL308	~~0.00~~
BE313	0.001
CA317	0.11
CU324	0.009

3000/581 REPLICATE 3

MG293	0.0
MN294	0.031
AL308	0.09

90

PEAK OFFSET

BE313	-0.003
CA317	0.15
CU324	0.005

PEAK OFFSET

3000/581 REPLICATE 4

MG293	0.2
MN294	0.027
AL308	0.07
BE313	0.002
CA317	0.04
CU324	0.009

70 $\bar{x}$ al = 90 ug/L

MCK 361

MG293	AV	0.2	SD	0.13	CV	63.0	200 ug	
MN294	AV	0.024	SD	0.0125	CV	53.0	24	
AL308	AV	~~0.06~~ 90	SD	0.050	CV	~~[illegible]~~ 28	90	
BE313	AV	-0.001	SD	0.0029	CV	440.3	1 ug	
CA317	AV	0.09	SD	0.049	CV	54.1	500 ug	
CU324	AV	0.009	SD	0.0029	CV	94.1	100 ug	

ug/L

rept 34 by LAB

3000/582 REPLICATE 1

MG293	50.2
MN294	0.286
AL308	1.88
BE313	0.047
CA317	113.52
CU324	0.238

OVER STD

3000/582 REPLICATE 2

MG293	50.3
MN294	0.269
AL308	1.94
BE313	0.047
CA317	114.08
CU324	0.244

OVER STD

3000/582 REPLICATE 3

MG293	49.3
MN294	0.251
AL308	1.81
BE313	0.047
CA317	115.54
CU324	0.244

OVER STD

3000/582 REPLICATE 4

MG293	50.5
MN294	0.277
AL308	1.75

3000/583 REPLICATE

MG293
MN294
AL308
BE313
CA317
CU324

3000/583 REPLICATE

MG293
MN294
AL308
BE313
CA317
CU324

3000/583 REPLICATE

MG293
MN294
AL308
BE313
CA317
CU324

Dop

MCK 355

MG293	AV
MN294	AV
AL308	AV
BE313	AV
CA317	AV
CU324	AV

3000/584 REPLICATE

MG293
MN294
AL308
BE313
CA317
CU324

3000/584 REPLICATE

MG293
MN294
AL308

PB220		0.00					
CO228		-0.01					PEAK OFFSET
NI231		0.02					
BA233		0.04					
FE238		5.45					

PEAK OFFSET

ORIGINAL (Red) 3/Red/c

MCK 364

CR205	AV	0.008	SD	0.0026	CV	33.1	[3]
ZN213	AV	0.248	SD	0.0050	CV	2.0	248
CD214	AV	0.003	SD	0.0027	CV	84.1	5 U
PB220	AV	0.02	SD	0.012	CV	67.1	40 U
CO228	AV	0.01	SD	0.013	CV	235.9	20 U
NI231	AV	0.02	SD	0.008	CV	51.7	30 U
~~BA233~~	~~AV~~	~~0.05~~	~~SD~~	~~[illegible]~~	~~CV~~	~~[illegible]~~	
FE238	AV	5.51	SD	0.128	CV	2.3	5,510

3000/581 REPLICATE 1

CR205	0.006
ZN213	~~0.000~~
CD214	0.006
PB220	0.03
CO228	0.00
NI231	-0.01
BA233	-0.01
FE238	0.06

361

AdBlk

PEAK OFFSET

PEAK OFFSET

PEAK OFFSET

D	0.0025	CV	34.4	[7]
D	0.0120	CV	6.0	200
	0.0024	CV	46.0	5
	0.061	CV	220.1	40 U
	0.012	CV	>999.0	20 U

mg/c

3000/581 REPLICATE 2

CR205	0.005
ZN213	~~0.017~~
CD214	0.005
PB220	-0.02
CO228	-0.01
NI231	-0.01
BA233	0.00
FE238	0.06

Reviewed dal 8/13/87

PEAK OFFSET

PEAK OFFSET

PEAK OFFSET

PEAK OFFSET

3000/581 REPLICATE 3

CR205	0.011
ZN213	~~0.017~~
CD214	0.005
PB220	0.03
CO228	-0.01
NI231	0.00
BA233	-0.00
FE238	0.06

PEAK OFFSET

PEAK OFFSET

3000/581 REPLICATE 4

CR205	0.016
ZN213	~~0.017~~
CD214	0.005
PB220	0.04
CO228	0.01
NI231	-0.00
BA233	0.01
FE238	0.07

PEAK OFFSET

.97

MCK 361

AdBlk

CR205	AV	0.009	SD	0.0051	CV	54.4	[9]
ZN213	AV	~~0.013~~	SD	0.0083	CV	64.6	~~[13]~~ [17]
CD214	AV	0.005	SD	0.0008	CV	14.4	5
PB220	AV	0.02	SD	0.030	CV	150.9	40 U
CO228	AV	0.00	SD	0.008	CV	996.0	20 U
NI231	AV	-0.01	SD	0.005	CV	84.8	30 U
BA233	AV	0.00	SD	0.009	CV	383.9	10 U
FE238	AV	0.06	SD	0.002	CV	3.4	[60]

mg/c

3000/582 REPLICATE 1

CR205	0.141
ZN213	0.188
CD214	0.041
PB220	0.41
CO228	0.38
NI231	0.29
BA233	1.61
FE238	1.86

3000/582 REPLICATE 2

CR205	0.147
ZN213	0.203
CD214	0.047
PB220	0.41
CO228	0.41
NI231	0.31
BA233	1.69
FE238	1.94

3000/582 REPLICATE 3

CR205	0.142
ZN213	0.201
CD214	0.041
PB220	
CO228	
NI231	
BA233	
FE238	

3000/582 REPLICATE 4

CR205	
ZN213	
CD214	
PB220	
CO228	
NI231	
BA233	
FE238	

CR205	AV
ZN213	AV
CD214	AV
PB220	AV
CO228	AV
NI231	AV
BA233	AV
FE238	AV

cpk

MCK 357

3000/583 REPLICATE 1

CR205	0
ZN213	0
CD214	0
PB220	
CO228	
NI231	
BA233	
FE238	

3000/583 REPLICATE 2

CR205	0
ZN213	0
CD214	0.
PB220	(
CO228	(
NI231	(
BA233	(
FE238	(

3000/583 REPLICATE 3

CR205	0.
ZN213	0.
CD214	0.
PB220	
CO228	0
NI231	0
BA233	0
FE238	0

3000/583 REPLICATE 4

CR205	-0.
ZN213	0.
CD214	0.
PB220	0
CO228	-0.
NI231	0.
BA233	0.

least 19

Calib. Blanks

~~.002~~
.001
.000
-.001
.002
-.001
.001
.001
-.002

$\bar{X}$ = .0000

SD = .0014

3·$\bar{X}$ = .0042 (6)

= 6.05 ppb

more likely IDL

0 – .002 → 2.6
5 – .003 → 4.33
50 – .028 → 47.4
200 – .117 → 201.

d.L capability questionable

y-int = 0.7419
slope = 1.700
r = 0.9999

R = 95 µg/L

ICV 95 [4]
ICB

ICV 20 39
0.052 0.055 0.054AV 0.0021SD ICV 93 R = 95
0.002 -0.001 -0.001AV 0.0007SD ICB 4U
3000/584-5856, 573-575
0.002 0.001 0.002AV 0.0007SD 3000/584 [4] r = 70 Free Blank (2.6)
0.003 0.010 0.006AV 0.0050SD 584 11
0.047 0.052 0.048AV 0.0057SD 3000/585 83 r = 220 MSA
0.060 0.061 0.061AV 0.0007SD 585 105
0.003 0.005 0.004AV 0.0014SD 3000/573 8.8 r = 102 MCK 352 8 ug/L (-6)
0.009 0.010 0.010AV 0.0007SD 573 18.0
0.004 0.003 0.004AV 0.0007SD 3000/574 7.8 r = 119 MSA
0.010 0.012 0.011AV 0.0014SD 574 19.7
0.004 0.007 0.005AV 0.0014SD 3000/575 6.0 r = 171 MSA
0.015 0.012 0.013AV 0.0021SD 575 23.4
CCV 21 30
0.059 0.057 0.058AV 0.0014SD CCV 100 ICV R = 102
0.002 -0.002 0.000AV 0.0028SD CCB 4U
3000/576-578
3000/576 [4] r = 99 MCK 355 [4] ug/L
0.000 0.002 0.001AV 0.0014SD 12.9
0.004 -0.002 0.001AV 0.0042SD 3000/577 4U r = 112 MCK 356 4U ug/L
0.007 0.004 0.006AV 0.0021SD 11.2
0.003 0.003 0.003AV 0.0000SD 3000/578 6.0 r = 35 MCK 357 (-6)
0.005 0.005 0.005AV 0.0000SD 9.5
0.002 0.001 0.001AV 0.0007SD 3000/579 4U r = 112 MCK 363 4U ug/L
0.006 0.007 0.006AV 0.0007SD 11.2
0.002 -0.001 0.000AV 0.0021SD 3000/580 4U r = 146 MCK 364 4U ug/L
0.011 0.005 0.008AV 0.0042SD 14.6
CCV 22 21
0.057 0.056 0.056AV 0.0007SD CCV 98 R = 100
0.001 -0.001 0.001AV 0.0000SD CCB 4U
3000/581-583, 589

SELENIUM 08/04/87 EPA CASE 7352 25000 FURNACE EDL E=37
MACK LABORATORIES ANALYST: NPH CO 03

CONTINUED

0.053	0.054	[illegible]	0.0007SD	CCV	101	R=103	
0.001	0.002	0.002AV	0.0007SD	CCB	[4]		
3000/581-583							
[illegible]	[illegible]	[illegible]	[illegible]	3000/581	44 11.2	r=112	
[illegible]	[illegible]	[illegible]	[illegible]	3000/582	7.8 21.4	r=136	MSA 582
[illegible]	0.012	[illegible]	[illegible]				
3000/583	44 9.5	r=95					
3000/575 (YS)	44 11.2	r=112					
CCV 01:04							
[illegible]	[illegible]	[illegible]	[illegible]	CCV	106	R=108	
[illegible]	[illegible]	[illegible]	0.0042SD	CCB	44		
3000/581-583 575 1/5							
0.001	0.003	0.002AV	0.0014SD	3000/581	2.6	86%	MCK 361 [4]
0.007	0.007	0.007AV	0.0008SD		11.2		
0.006	0.012	0.005AV	0.0028SD	3000/582	14.6 23.1	r=85	Spk. MCK 357 15 ug/L
0.012	0.014	0.013AV	0.0014SD				
-0.000	0.002	0.001AV	0.0014SD	3000/583	44	r=112 (9%)	Dup MCK 355 40 ug/L
0.004	0.009	0.006AV	0.0035SD	583 to	11.2		
-0.003	0.001	-0.001AV	0.0028SD	3000/575 (YS)	44 9.5	r=95	MCK 357 30 ug/L
0.006	0.004	0.005AV	0.0014SD				
CCV 01:01 0.062	0.055	[illegible]	0.0050SD	CCV	100	R=102	
0.001	0.001	0.001AV	0.0000SD	CCB	44		

3000/585 MSA 1/5 + 0, 0.010, 0.020, 0.030
3000/574 MSA + 0 0.005, 0.010, 0.015
3000/575 MSA + 0, 0.005, 0.010, 0.015

0.006	0.014	0.021	0.026	~~3000/585 (YS) MSA~~
3000/585 MSA REPEAT				
0.007	0.016	0.019	0.027	

3000/585 MSA 1/2 = 0, 0.020, 0.040, 0.060

H_2O LCS

0.027	0.043	0.056	0.067	3000/585 (YS)	MSA	85 ug/L	r=0.9963 2R=86
3000/574 MSA							
[illegible]	[illegible]	[illegible]	[illegible]				
0.003	[illegible]	0.010	0.014	3000/574 A		3 ug/L	r=0.988 MCK 353
0.003	0.005	0.010	0.019	3000/575 A		3=44 ug/L	r=0.9191 MCK 354
CCV 03:25							
[illegible]	[illegible]	[illegible]	0.0071SD	CCV	93	R=95	
-0.000	-0.003	0.000AV	0.0021SD	CCB	44		
3000/574 MSA REPEAT							
3000/575 MSA REPEAT							
0.005	0.002	0.000	0.013	3000/574 B		4.3 ug/L	r=0.7766 MCK 353
-0.001	0.007	0.010	0.014	575 B		0.3 ug/L	44 ug/L R=0.9757 MCK 353
CCV 04:12							
0.055	0.057	0.050AV	0.0014SD	CCV	96	R=98	
0.002	0.001	0.002AV	0.0007SD	CCB	[4]		

Samples taken 5/28

CASE 7352

Hg digestion
Volume
100 mls

7/1/87

prep date

F

3000/573

573 S - 578
583 D - 584
587 Blank
585 LCS

analysis date

MERCURY 07/23/87 EPA CASE 7352 25000 COLDF-- VAPOR EDL E=62
MACK LABORATORIES ANALYST: NFR 15:30

INITIAL CALIBRATION: EPA CASE 7370

3000/584, 585, 573-580

-0.001	-0.002	-0.002AV	0.00078D	~~3000/584~~	~~Prep Blank~~	~~0.2U ug/L~~	
0.066	0.065	0.067AV	0.0021SD	3000/585	HgOLCS	4.1 ug/L	R=88
0.003	0.004	0.003AV	0.00078D	3000/573	MCK 352	~~0.3 ug/L~~ 0.27 ug/L ✓	
~~0.003~~	~~0.005~~	~~0.004AV~~	~~0.00071SD~~	~~3000/574~~	~~MCK 353~~	~~0.3 ug/L~~	
~~0.002~~	~~0.001~~	~~0.001AV~~	~~0.0002SD~~	~~3000/575~~			
0.001	0.002	0.002AV	0.00078D	3000/576	MCK 354	0.2 U ug/L ✓	
0.001	0.002	0.002AV	0.00078D	3000/577	MCK 355	0.20 ✓	
0.035	0.035	0.035AV	0.00008D	3000/578	MCK 356	0.20 ✓	
0.003	0.002	0.002AV	0.00078D	3000/579	MCK 357	2.2 ✓	
0.001	0.001	0.001AV	0.00008D	3000/580	MCK 363	0.20 ✓	
CCV 16 33					MCK 364	0.2 U ✓	
0.079	0.086	0.082AV	0.00508D	CCV	5.3 ug/L	R=102	
0.003	0.002	0.002AV	0.00078D	CCB	0.2 ug/L		
3000/581-~~589~~ 583							
-0.001	-0.000	-0.001AV	0.00078D	3000/581	0.2U ug/L ✓	~~Spk MCK 357~~ MCK 361	
0.014	0.015	0.014AV	0.00078D	3000/582	0.93 ug/L	Spk MCK 357	<SPL
-0.000	-0.000	-0.000AV	0.00008D	3000/583	0.2U ug/L	Dup MCK 355	
CCV 16 51							
0.079	0.073	0.076AV	0.00428D	CCV	4.7	R=90	
0.001	-0.001	-0.000AV	0.0014SD	CCB	0.2U		

JCN 8/13/87

Should have rerun mck357 spk

ORIGINAL (Red)

Form VIII

Q. C. Report No.: 3000/44

STANDARD ADDITION RESULTS

LAB NAME: Mack Laboratories

CASE NO.: 7352

DATE: August 18, 1987

UNITS: ug/L

Sample #	Element	0 ADD ABS.	1 ADD Con./ ABS.[1]	2 ADD Con./ ABS.[1]	3 ADD Con./ ABS.[1]	Final CON[2]	r*
H_2O LCS	As	0.047	10/0.073	20/0.093	30/0.116	42	0.999
MCK 352	Pb	0.005	5/0.016	10/0.026	15/0.031	4 U	0.988 +
MCK 352	Pb	0.011	10/0.020	10/0.025	15/0.039	6	0.982 +
MCK 353	Pb	0.002	5/0.014	10/0.022	15/0.033	4 U	0.997
MCK 354	Pb	0.006	5/0.016	10/0.027	15/0.032	4 U	0.989 +
MCK 354	Pb	0.013	5/0.022	10/0.029	15/0.039	8	0.998
MCK 355	Pb	0.009	5/0.018	10/0.026	15/0.036	5	0.999
MCK 356	Pb	0.014	5/0.022	10/0.032	15/0.039	8	0.998
MCK 360	Pb	0.017	5/0.029	10/0.049	15/0.065	6	0.982+
MCK 360	Pb	0.010	5/0.016	10/0.025	15/0.031	7	0.996
H_2O LCS	Pb	0.031	10/0.043	20/0.069	30/0.069	117	0.997+
H_2O LCS	Pb	0.025	10/0.043	20/0.068	30/0.075	84	0.992+
MCK 353	Se	0.003	5/0.008	10/0.010	15/0.014	5	0.988
MCK 353	Se	0.005	5/0.002	10/0.006	15/0.013	[4]	0.777+
MCK 354	Se	0.005	5/0.005	10/0.010	15/0.019	4 U	0.919+
MCK 354	Se	0.001	5/0.007	10/0.010	15/0.014	4 U	0.976+
H_2O LCS	Se	0.027	20/0.043	40/0.056	60/0.067	85	0.996
Spk. MCK 357	Tl	0.036	10/0.054	20/0.076	30/0.088	41	0.994+
Spk. MCK 357	Tl	0.039	10/0.059	20/0.075	30/0.091	47	0.998
H_2O LCS	Tl	0.024	10/0.041	20/0.052	30/0.071	80	0.995

1 CON is the concentration added, ABS. is the instrument readout in absorbance or concentration.

2 Concentration as determined by MSA

* "r" is the correlation coefficient.
+ - correlation coefficient is outside of control window of 0.995.

All results for samples have been flagged for blank contamination

SITE NAME: [illegible]

TDD NO.: F3-8704-77

EPA SITE NO.: PA 1749

REGION: III

SUPPORT DOCUMENTATION FOR THE REVIEW OF INORGANIC ANALYTICAL DATA PACKAGE

ORIGINAL (Red)

CASE/SAS NO.: 7548

TYPE OF ANALYSIS: INORGANICS & CN

CONTRACT LABORATORY: NANCO

APPLICABLE IFB OR SOW: 7/85

REVIEWER: Roy Cohen

REVIEW DATE: August 4, 1987

APPLICABLE SAMPLE NO's.: mck 365 - 371, mck 486, mck 487

THE FOLLOWING TABLE INDICATES AREAS WHICH WERE EXAMINED IN DETAIL, THE IDENTIFIED PROBLEM AREAS, AND SUPPORT DOCUMENTATION ATTACHMENTS:

	AREAS EXAMINED IN DETAIL — CHECK (✓) IF YES OR FOOTNOTE LETTER FOR COMMENTS BELOW					PROBLEM AREAS IDENTIFIED — CHECK (✓) IF YES OR FOOTNOTE NUMBER FOR COMMENTS BELOW					SUPPORT DOCUMENTATION ATTACHMENTS — CHECK (✓) IF YES OR IDENTIFY ATTACHMENT NO.				
	ALL APPLICABLE ANALYSES	ICP OR A.A. METALS	FURNACE METALS	COLD VAPOR MERCURY	CYANIDE	ALL APPLICABLE ANALYSES	ICP OR A.A. METALS	FURNACE METALS	COLD VAPOR MERCURY	CYANIDE	ALL APPLICABLE ANALYSES	ICP OR A.A. METALS	FURNACE METALS	COLD VAPOR MERCURY	CYANIDE
HOLDING TIMES	✓														
BLANK ANALYSIS RESULTS	✓						1				A				
MATRIX SPIKES (PRE-DIGESTION)	✓						3				B				
DUPLICATES	✓										C				
QUANTITATION OF RESULTS	✓														
DETECTION LIMITS/SENSITIVITY	✓								4					J	
INITIAL CALIBRATIONS	✓										D				
CONTINUING CALIBRATIONS	✓										D				
LABORATORY CONTROL STANDARDS	✓										E				
ICP LINEAR RANGE ANALYSIS	✓						2					F			
ICP INTERFERENCE CHECKS	✓											G			
ICP SERIAL DILUTIONS	✓											H			
GFAA POST-DIGESTION SPIKES	✓							3					B		
GFAA DUPLICATE BURNS	✓														
GFAA STANDARD ADDITIONS	✓												I		
OTHERS field duplicates	✓						5								

COMMENTS: (1) Levels of iron and zinc in field blanks > CRDL

(2) Linear Range analysis indicates low recovery for nearly every metal (possible higher d.L. for Sb, Cr)

(3) Many spike recoveries out of control limits

(4) Detection limits may be higher than reported because of low absorbance of low Hg standards. Poss. positive result for mck 365

(5) Several field duplicate results not precise (not in good agreement)

ORIGINAL (Red)

A

INORGANIC ANALYSIS DATA SHEET
FORM III

Lab Name : NANCO LABORATORIES, INC.

Case NO.: 7548

Q.C. REPORT NO.: 558

SOW NO. 785

PAGE 1 OF 4

DATE: 7/27/87

BLANKS

UNITS UG/L

	INITIAL CALIBRATION BLANK VALUE	CONTINUING CALIBRATION BLANK VALUE 1	2	3	4	PREPARATION BLANK MATRIX: WATER	MATRIX:
1. ALUMINUM	100 U	100 U	100 U	100 U	100 U	100 U	
2. ANTIMONY	30 U	30 U	30 U	30 U	30 U	30 U	
3. ARSENIC	5 U	5 U	5 U	5 U	5 U	5 U	
4. BARIUM	25 U	25 U	25 U	25 U	25 U	25 U	
5. BERYLLIUM	2 U	2 U	2 U	2 U	2 U	2 U	
6. CADMIUM	5 U	5 U	5 U	5 U	5 U	5 U	
7. CALCIUM	1500 U	1500 U	1500 U	1500 U	1500 U	1500 U	
8. CHROMIUM	10 U	10 U	10 U	10 U	10 U	10 U	
9. COBALT	25 U	25 U	25 U	25 U	25 U	25 U	
10. COPPER	15 U	15 U	15 U	15 U	15 U	15 U	
11. IRON	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U	
12. LEAD	50 U	50 U	50 U	50 U	50 U	5 U	
13. MAGNESIUM	500 U	500 U	500 U	500 U	500 U	500 U	
14. MANGANESE	10 U	10 U	10 U	10 U	10 U	10 U	
15. MERCURY	.2 U	.2 U	.2 U	.2 U		.2 U	
16. NICKEL	30 U	30 U	30 U	30 U	30 U	30 U	
17. POTASSIUM	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U	
18. SELENIUM	5 U	5 U	5 U	5 U	5 U	5 U	
19. SILVER	10 U	10 U	10 U	10 U	10 U	10 U	
20. SODIUM	1500 U	1500 U	1500 U	1500 U	1500 U	1500 U	
21. THALLIUM	5 U	5 U	5 U	5 U	5 U	5 U	
22. VANADIUM	30 U	30 U	30 U	30 U	30 U	30 U	
23. ZINC	10 U	10 U	10 U	10 U	10 U	10 U	
24. CYANIDE	10 U	10 U	10 U			10 U	

0000023

ORIGINAL (Red)

B

INORGANIC ANALYSIS DATA SHEET
FORM V
SAMPLE SPIKE RECOVERY

Lab Name : NANCO LABORATORIES, INC.

Case NO. : 7548

QC REPORT NO. : 558

EPA Sample ID: MCK-365

PAGE 1 OF 1

Lab Sample ID: 7548-MCK-365-558

DATE: 7/27/87

UNITS: UG/L

MATRIX: WATER

	CONTROL LIMIT % R	SPIKED SAMPLE RESULTS (SSR)	SAMPLE RESULTS (SR)	SPIKE ADDED (SA)	1 % R	
1. ALUMINUM	75-125	9350.0	10240.0	2000.0	44.5	N
2. ANTIMONY	75-125	723.0	145.0	500.0	115.6	
3. ARSENIC	75-125	22.7	5 U	20.0	113.5	10
4. BARIUM	75-125	2699.0	314.0	2000.0	119.3	
5. BERYLLIUM	75-125	70.0	2.0	50.0	136.0 N	
6. CADMIUM	75-125	66.0	9.0	50.0	114.0	
7. CALCIUM	75-125	38600.0	42700.0	NR	NR	
8. CHROMIUM	75-125	233.0	30.0	200.0	101.5	3X CRDL
9. COBALT	75-125	658.0	86.0	500.0	114.4	
10. COPPER	75-125	447.0	180.0	250.0	106.8	
11. IRON *	75-125	29000.0	43300.0	1000.0	~~-1430~~	(0%)
12. LEAD	75-125	20.3	51.5	20.0	156.0 N	? 10
13. MAGNESIUM	75-125	14200.0	16200.0	NR	NR	
14. MANGANESE	75-125	1909.0	1812.0	200.0	48.5	
15. MERCURY **	75-125	0.70	.2 U	1.0	70.0 N	
16. NICKEL	75-125	503.0	30 U	400.0	125.8 N	
17. POTASSIUM	75-125	[2800.0]	[3200.0]	NR	NR	
18. SELENIUM	75-125	5 U	50 U	10.0	0.0 N	→ instr. level 75%
19. SILVER	75-125	53.0	10 U	50.0	106.0	5X CRDL
20. SODIUM	75-125	42800.0	47100.0	NR	NR	
21. THALLIUM	75-125	43.2	5 U	50.0	86.4	
22. VANADIUM	75-125	621.0	30 U	500.0	124.2	
23. ZINC *	75-125	4345.0	4574.0	200.0	~~-114.5~~	0%
24. CYANIDE	75-125	93.0	10 U	200.0	~~46.5~~ N	93

NR = NOT REQUIRED

** = RUN ON SAMPLE MCK-366

* sample results much higher than spike concentration (Fe: 29 X higher, Zn 20 X higher)

ORIGINAL (Red)

INORGANIC ANALYSIS DATA SHEET
FORM III

Lab Name : NANCO LABORATORIES, INC. Case NO.: 7548

Q.C. REPORT NO.: 558 SOW NO. 785

PAGE 2 OF 4 DATE: 7/27/87

BLANKS

UNITS UG/L

	INITIAL CALIBRATION BLANK VALUE	CONTINUING CALIBRATION BLANK VALUE 1	2	3	4	PREPARATION BLANK MATRIX:	MATRIX:
1. ALUMINUM		100 U					
2. ANTIMONY		30 U					
3. ARSENIC		5 U					
4. BARIUM		25 U					
5. BERYLLIUM		2 U					
6. CADMIUM		5 U					
7. CALCIUM		1500 U					
8. CHROMIUM		10 U					
9. COBALT		25 U					
10. COPPER		15 U					
11. IRON		1000 U					
12. LEAD		50 U					
13. MAGNESIUM		500 U					
14. MANGANESE		10 U					
15. MERCURY							
16. NICKEL		30 U					
17. POTASSIUM		1000 U					
18. SELENIUM							
19. SILVER		10 U					
20. SODIUM		1500 U					
21. THALLIUM							
22. VANADIUM		30 U					
23. ZINC		10 U					
24. CYANIDE							

ORIGINAL (Red)

INORGANIC ANALYSIS DATA SHEET
FORM III

Lab Name : NANCO LABORATORIES, INC.

Case NO.: 7548

Q.C. REPORT NO.: 558

SOW NO. 785

PAGE 3 OF 4

DATE: 7/27/87

BLANKS

UNITS UG/L

	INITIAL CALIBRATION BLANK VALUE	CONTINUING CALIBRATION BLANK VALUE 1	2	3	4	PREPARATION BLANK MATRIX:	MATRIX:
1. ALUMINUM							
2. ANTIMONY							
3. ARSENIC							
4. BARIUM							
5. BERYLLIUM							
6. CADMIUM							
7. CALCIUM							
8. CHROMIUM							
9. COBALT							
10. COPPER							
11. IRON							
12. LEAD	5 U	5 U	5 U	5 U	5 U		
13. MAGNESIUM							
14. MANGANESE							
15. MERCURY							
16. NICKEL							
17. POTASSIUM							
18. SELENIUM							
19. SILVER							
20. SODIUM							
21. THALLIUM							
22. VANADIUM							
23. ZINC							
24. CYANIDE							

ORIGINAL (Red)

INORGANIC ANALYSIS DATA SHEET

FORM III

Lab Name : NANCO LABORATORIES, INC.

Case NO.: 7548

Q.C. REPORT NO.: 558

SOW NO. 785

DATE: 7/27/87

BLANKS

UNITS UG/L

	INITIAL CALIBRATION BLANK VALUE	CONTINUING CALIBRATION BLANK VALUE 1	2	3	4	PREPARATION BLANK MATRIX:	MATRIX:
1. ALUMINUM							
2. ANTIMONY							
3. ARSENIC							
4. BARIUM							
5. BERYLLIUM							
6. CADMIUM							
7. CALCIUM							
8. CHROMIUM							
9. COBALT							
10. COPPER							
11. IRON							
12. LEAD		5 U					
13. MAGNESIUM							
14. MANGANESE							
15. MERCURY							
16. NICKEL							
17. POTASSIUM							
18. SELENIUM							
19. SILVER							
20. SODIUM							
21. THALLIUM							
22. VANADIUM							
23. ZINC							
24. CYANIDE							

ORIGINAL (Red)

INORGANIC ANALYSIS DATA SHEET
FORM II

Lab Name : NANCO LABORATORIES, INC. Case NO.: 7548

QC REPORT: 558 SOW NO. 785

PAGE 2 OF 6 DATE: 7/27/87

INITIAL & CONTINUING CALIBRATION VERIFICATION

UNITS: UG/L

	1 INITIAL CALIBRATION			2 CONTINUING CALIBRATION					4
	TRUE VALUE	FOUND	% R	TRUE VALUE	FOUND	% R	FOUND	% R	METHOD
1. ALUMINUM				12500.0	12550.0	100	12210.0	98	P
2. ANTIMONY				5000.0	4934.0	99	4989.0	100	P
3. ARSENIC				50.0	48.0	96	48.0	96	F
4. BARIUM				5000.0	5155.0	103	5081.0	102	P
5. BERYLLIUM				500.0	495.0	99	497.0	99	P
6. CADMIUM				2500.0	2384.0	95	2488.0	100	P
7. CALCIUM				250000.0	240900.0	96	255200.0	102	P
8. CHROMIUM				5000.0	4819.0	96	4840.0	97	P
9. COBALT				5000.0	4734.0	95	4857.0	97	P
10. COPPER				5000.0	4575.0	92	5135.0	103	P
11. IRON				15000.0	13600.0	91	15100.0	101	P
12. LEAD				5000.0	4729.0	95	5207.0	104	P
13. MAGNESIUM				250000.0	246100.0	98	261700.0	105	P
14. MANGANESE				5000.0	4897.0	98	5212.0	104	P
15. MERCURY				3.0	2.99	100	2.88	96	CV
16. NICKEL				5000.0	4782.0	96	4944.0	99	P
17. POTASSIUM				50000.0	49600.0	99	49300.0	99	P
18. SELENIUM				50.0	46.0	92	48.0	96	F
19. SILVER				5000.0	4531.0	91	4678.0	94	P
20. SODIUM				50000.0	51400.0	103	52100.0	104	P
21. THALLIUM				50.0	45.0	90	51.0	102	F
22. VANADIUM				5000.0	4834.0	97	4864.0	97	P
23. ZINC				2500.0	2279.0	91	2371.0	95	P
24. CYANIDE				100.0	100.2	100			T

1 = INITIAL CALIBRATION SOURCES : ICV - EPA MADE 2 = CONTINUING CALIBRATION SOURCE BUCK SCIENTIFIC STOCK

3 = CONTROL LIMITS: MERCURY 80-120 OTHER METAL 90-110: CYANIDE 85-115

4 = INDICATE ANALYTICAL METHOD USED : P - ICP: A - FLAME AA: F - FURNACE AA : CV COLD VAPOR

ORIGINAL (Red)

INORGANIC ANALYSIS DATA SHEET
FORM II

Lab Name : NANCO LABORATORIES, INC. Case NO.: 7548

QC REPORT: 558 SOW NO. 785

PAGE 3 OF 6 DATE: 7/27/87

INITIAL & CONTINUING CALIBRATION VERIFICATION

UNITS: UG/L

	1 INITIAL CALIBRATION			2 CONTINUING CALIBRATION					4
	TRUE VALUE	FOUND	% R	TRUE VALUE	FOUND	% R	FOUND	% R	METHOD
1. ALUMINUM				12500.0	12540.0	100	11740.0	94	P
2. ANTIMONY				5000.0	4848.0	97	4602.0	92	P
3. ARSENIC				50.0	46.0	92	46.0	92	F
4. BARIUM				5000.0	4878.0	98	5094.0	102	P
5. BERYLLIUM				500.0	512.0	102	488.0	98	P
6. CADMIUM				2500.0	2339.0	94	2289.0	92	P
7. CALCIUM				250000.0	237700.0	95	258800.0	104	P
8. CHROMIUM				5000.0	4863.0	97	4959.0	99	P
9. COBALT				5000.0	4718.0	94	5162.0	103	P
10. COPPER				5000.0	4600.0	92	5062.0	101	P
11. IRON				15000.0	15000.0	100	15400.0	103	P
12. LEAD				5000.0	5300.0	106	4669.0	93	P
13. MAGNESIUM				250000.0	249100.0	100	263000.0	105	P
14. MANGANESE				5000.0	4933.0	99	5179.0	104	P
15. MERCURY									
16. NICKEL				5000.0	4779.0	96	4600.0	92	P
17. POTASSIUM				50000.0	49100.0	98	53700.0	107	P
18. SELENIUM				50.0	50.0	100			F
19. SILVER				5000.0	4514.0	90	5447.0	109	P
20. SODIUM				50000.0	47000.0	94	50200.0	100	P
21. THALLIUM				50.0	46.0				F
22. VANADIUM				5000.0	5083.0	102	5057.0	101	P
23. ZINC				2500.0	2254.0	90	2464.0	99	P
24. CYANIDE									

1 = INITIAL CALIBRATION SOURCES : ICV - EPA MADE 2 = CONTINUING CALIBRATION SOURCE BUCK SCIENTIFIC STOCK

3 = CONTROL LIMITS: MERCURY 80-120 OTHER METAL 90-110: CYANIDE 85-115

4 = INDICATE ANALYTICAL METHOD USED : P - ICP: A - FLAME AA: F - FURNACE AA : CV COLD VAPOR

ORIGINAL

INORGANIC ANALYSIS DATA SHEET
FORM II

Lab Name : NANCO LABORATORIES, INC. Case NO.: 7548

QC REPORT: 558 SOW NO. 785

PAGE 4 OF 6 DATE: 7/27/87

INITIAL & CONTINUING CALIBRATION VERIFICATION

UNITS: UG/L

	1 INITIAL CALIBRATION			2 CONTINUING CALIBRATION					
	TRUE VALUE	FOUND	% R	TRUE VALUE	FOUND	% R	FOUND	% R	4 METHOD
1. ALUMINUM									
2. ANTIMONY									
3. ARSENIC									
4. BARIUM									
5. BERYLLIUM									
6. CADMIUM									
7. CALCIUM									
8. CHROMIUM									
9. COBALT									
10. COPPER									
11. IRON									
12. LEAD	49.0	52.0	106	50.0	50.0	100	46.0	92	F
13. MAGNESIUM									
14. MANGANESE									
15. MERCURY									
16. NICKEL									
17. POTASSIUM									
18. SELENIUM									
19. SILVER									
20. SODIUM									
21. THALLIUM									
22. VANADIUM									
23. ZINC									
24. CYANIDE									

1 = INITIAL CALIBRATION SOURCES : ICV - EPA MADE 2 = CONTINUING CALIBRATION SOURCE BUCK SCIENTIFIC STOCK

3 = CONTROL LIMITS: MERCURY 80-120 OTHER METAL 90-110: CYANIDE 85-115

4 = INDICATE ANALYTICAL METHOD USED : P - ICP: A - FLAME AA: F - FURNACE AA : CV COLD VAPOR

ORIGINAL (Red)

INORGANIC ANALYSIS DATA SHEET
FORM II

Lab Name : NANCO LABORATORIES, INC. Case NO.: 7548

QC REPORT: 558 SOW NO. 785

PAGE 5 OF 6 DATE: 7/27/87

INITIAL & CONTINUING CALIBRATION VERIFICATION

UNITS: UG/L

	1 INITIAL CALIBRATION			2 CONTINUING CALIBRATION					4
	TRUE VALUE	FOUND	% R	TRUE VALUE	FOUND	% R	FOUND	% R	METHOD
1. ALUMINUM									
2. ANTIMONY									
3. ARSENIC									
4. BARIUM									
5. BERYLLIUM									
6. CADMIUM									
7. CALCIUM									
8. CHROMIUM									
9. COBALT									
10. COPPER									
11. IRON									
12. LEAD				50.0	47.0	94	53.0	106	F
13. MAGNESIUM									
14. MANGANESE									
15. MERCURY									
16. NICKEL									
17. POTASSIUM									
18. SELENIUM									
19. SILVER									
20. SODIUM									
21. THALLIUM									
22. VANADIUM									
23. ZINC									
24. CYANIDE									

1 = INITIAL CALIBRATION SOURCES : ICV - EPA MADE 2 = CONTINUING CALIBRATION SOURCE BUCK SCIENTIFIC STOCK

3 = CONTROL LIMITS: MERCURY 80-120 OTHER METAL 90-110: CYANIDE 85-115

4 = INDICATE ANALYTICAL METHOD USED : P - ICP: A - FLAME AA: F - FURNACE AA : CV COLD VAPOR

INORGANIC ANALYSIS DATA SHEET
FORM II

Lab Name : NANCO LABORATORIES, INC. Case NO.: 7548

QC REPORT: 558 SOW NO. 785

PAGE 6 OF 6 DATE: 7/27/87

INITIAL & CONTINUING CALIBRATION VERIFICATION

UNITS: UG/L

	1 INITIAL CALIBRATION			2 CONTINUING CALIBRATION					
	TRUE VALUE	FOUND	% R	TRUE VALUE	FOUND	% R	FOUND	% R	4 METHOD
1. ALUMINUM									
2. ANTIMONY									
3. ARSENIC									
4. BARIUM									
5. BERYLLIUM									
6. CADMIUM									
7. CALCIUM									
8. CHROMIUM									
9. COBALT									
10. COPPER									
11. IRON									
12. LEAD				50.0	51.0	102	55.0	110	F
13. MAGNESIUM									
14. MANGANESE									
15. MERCURY									
16. NICKEL									
17. POTASSIUM									
18. SELENIUM									
19. SILVER									
20. SODIUM									
21. THALLIUM									
22. VANADIUM									
23. ZINC									
24. CYANIDE									

1 = INITIAL CALIBRATION SOURCES : ICV - EPA MADE 2 = CONTINUING CALIBRATION SOURCE BUCK SCIENTIFIC STOCK

3 = CONTROL LIMITS: MERCURY 80-120 OTHER METAL 90-110: CYANIDE 85-115

4 = INDICATE ANALYTICAL METHOD USED : P - ICP: A - FLAME AA: F - FURNACE AA : CV COLD VAPOR

INORGANIC ANALYSIS DATA SHEET

FORM VII

INSTRUMENT DETECTION LIMITS AND LABORATORY CONTROL SAMPLE

Lab Name : NANCO LABORATORIES, INC. Case NO. : 7548

QC REPORT NO. : 558 LCS = EPA MADE

PAGE 1 OF 3 DATE: 7/27/87

	REQUIRED DETECTION LIMITS (CRDL) UG/L	INSTRUMENT DETECTION LIMITS (IDL) UG/L ICP: 1 **	FURNACE 1 ***	LAB CONTROL SAMPLE UG/L OR MG/KG DRY WEIGHT (CIRCLE ONE) TRUE	FOUND	% R
1. ALUMINUM	200	100	NR	1980	2110	107
2. ANTIMONY	60	30	NR	807	719	89
3. ARSENIC	10	50	5	12.4	12.9	104
4. BARIUM	200	25	NR	1980	2044	103
5. BERYLLIUM	5	2	NR	481	476	99
6. CADMIUM	5	5	NR	489.0	496.0	101
7. CALCIUM	5000	1500	NR	49800	51200	103
8. CHROMIUM	10	10	NR	506.0	474.0	94
9. COBALT	50	25	NR	474.0	494.0	104
10. COPPER	25	15	NR	542.0	528	97
11. IRON	100	40	NR	1990	2034	102
12. LEAD	5	50	NR	NR	NR	NR
13. MAGNESIUM	5000	500	NR	25000	24600	98
14. MANGANESE	15	10	NR	513	517	101
15. MERCURY	0.2	NR	NR	NR	NR	NR
16. NICKEL	40	30	NR	496.0	477.0	96
17. POTASSIUM	5000	1000	NR	50200	52800	105
18. SELENIUM	5	NR	NR	NR	NR	NR
19. SILVER	10	10	NR	509	539	106
20. SODIUM	5000	1500	NR	50700	51800	102
21. THALLIUM	10	NR	NR	NR	NR	NR
22. VANADIUM	50	30	NR	511.0	521.0	102
23. ZINC	20	10	NR	3100	2962.0	96
24. CYANIDE		NR	NR	NR	NR	NR

NR = NOT REQUIRED

** = ALLIED ANALYTICAL PLASMA 200

*** = VARIAN SPECTRA AA 40

ORIGINAL (Red)

INORGANIC ANALYSIS DATA SHEET
FORM VI
DUPLICATES

Lab Name : NANCO LABORATORIES, INC.

Case NO. : 7548

QC REPORT NO.: 558

EPA Sample ID: MCK-365

PAGE 1 OF 1

Lab Sample ID: 7548-MCK-365-558

DATE: 7/27/87

UNITS : UG/L

MATRIX: WATER

	1 CONTROL LIMIT	SAMPLE RESULTS (S)	SAMPLE DUPLICATES RESULTS (D)	2 RPD
1. ALUMINUM		10240.0	10230.0	0.1
2. ANTIMONY		145.0	30 U	NC
3. ARSENIC		5 U	5 U	NC
4. BARIUM		314.0	310.0	1.3
5. BERYLLIUM		2.0	2 U	NC
6. CADMIUM		9.0	5 U	NC
7. CALCIUM		42700.0	42800.0	0.2
8. CHROMIUM		30.0	27.0	10.5
9. COBALT		86.0	91.0	5.6
10. COPPER		180.0	177.0	1.7
11. IRON		43300.0	44100.0	1.8
12. LEAD		51.5 S	25 U	NC
13. MAGNESIUM		16200.0	16300.0	0.6
14. MANGANESE		1812.0	1835.0	1.3
15. MERCURY **		.2 U	.2 U	NC
16. NICKEL		30 U	30 U	NC
17. POTASSIUM		[3200.0]	[3400.0]	NC
18. SELENIUM		50 U	50 U	NC
19. SILVER		10 U	10 U	NC
20. SODIUM		47100.0	46400.0	1.5
21. THALLIUM		5 U	5 U	NC
22. VANADIUM		30 U	30 U	NC
23. ZINC		4574.0	4924.0	7.4
24. CYANIDE		10 U	10 U	NC

1 = TO BE ADDED AT A LATER DATE NC = NON CALCULABLE RPD DUE TO VALUE(S) LESS THAN CRDL

** = RUN ON SAMPLE MCK-366

ORIGINAL (Red)

INORGANIC ANALYSIS DATA SHEET
FORM II

Lab Name : NANCO LABORATORIES, INC.

Case NO.: 7548

QC REPORT: 558

SOW NO. 785

PAGE 1 OF 6

DATE: 7/27/87

INITIAL & CONTINUING CALIBRATION VERIFICATION

UNITS: UG/L

	1 INITIAL CALIBRATION			2 CONTINUING CALIBRATION					4
	TRUE VALUE	FOUND	% R	TRUE VALUE	FOUND	% R	FOUND	% R	METHOD
1. ALUMINUM	1980.0	1940.0	98	12500.0	12380.0	99	13700.0	110	P
2. ANTIMONY	807.0	750.0	93	5000.0	4870.0	97	4964.0	99	P
3. ARSENIC	49.0	53.0	108	50.0	52.0	104	46.0	92	F
4. BARIUM	1980.0	2080.0	105	5000.0	5200.0	104	4857.0	97	P
5. BERYLLIUM	481.0	477.0	99	500.0	504.0	101	519.0	104	P
6. CADMIUM	489.0	496.0	101	2500.0	2393.0	96	2437.0	97	P
7. CALCIUM	49800.0	51600.0	104	250000.0	250600.0	100	240200.0	96	P
8. CHROMIUM	506.0	508.0	100	5000.0	4780.0	96	5037.0	101	P
9. COBALT	474.0	488.0	103	5000.0	4782.0	96	4995.0	100	P
10. COPPER	542.0	489.0	90	5000.0	5037.0	101	4732.0	95	P
11. IRON	1990.0	2000.0	101	15000.0	14500.0	97	14200.0	95	P
12. LEAD	4510.0	4280.0	95	5000.0	5227.0	105	5319.0	106	P
13. MAGNESIUM	25000.0	24800.0	99	250000.0	256900.0	103	248900.0	100	P
14. MANGANESE	513.0	541.0	105	5000.0	5070.0	101	4963.0	99	P
15. MERCURY	5.0	4.85	97	3.0	3.12	104	2.73	91	CV
16. NICKEL	496.0	463.0	93	5000.0	4847.0	97	4975.0	100	P
17. POTASSIUM	50200.0	47900.0	95	50000.0	47300.0	95	48200.0	96	P
18. SELENIUM	49.0	49.0	100	50.0	51.0	102	54.0	108	F
19. SILVER	509.0	560.0	110	5000.0	4716.0	94	4558.0	91	P
20. SODIUM	50700.0	49900.0	98	50000.0	52000.0	104	49500.0	99	P
21. THALLIUM	49.0	48.0	98	50.0	46.0	92	46.0	92	F
22. VANADIUM	511.0	514.0	101	5000.0	4990.0	100	5046.0	101	P
23. ZINC	3100.0	2911.0	94	2500.0	2460.0	98	2354.0	94	P
24. CYANIDE	224.0	236.3	105	100.0	100.2	100	100.2	100	T

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