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APR 23 1997

ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT 620394

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1	HNF-SD-WM-DP-241, REV. 0	N/A	0	Tank 241-AP-103, Grab Sample 3AP-97-1 Analytical Results for the Final Report	Q	2	1	1			
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		Design Authority									
		Design Agent									
2	1	Cog.Eng. R. A. Esch	<i>Ruth Esch</i>	4/18/97							
2	1	Cog. Mgr. A. D. Rice	<i>A. D. Rice</i>	4-22-97							
2	1	QA T. L. Tung	<i>T. L. Tung</i>	4/18/97							
		Safety									
		Env.									
18. L. A. Diaz <i>L. A. Diaz</i> 4/18/97 Signature of LUT Date Originator		19. N/A Authorized Representative Date for Receiving Organization		20. A. D. Rice <i>A. D. Rice</i> 4-22-97 Design Authority/ Cognizant Manager Date		21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments					

TANK 241-AP-103, GRAB SAMPLE 3AP-97-1 ANALYTICAL RESULTS FOR THE FINAL REPORT

Ruth Esch
Rust Federal Services of Hanford, INC., Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

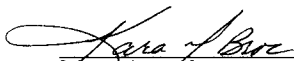
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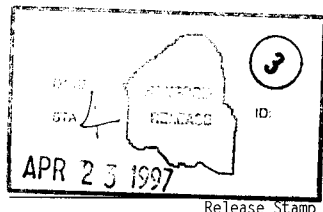
Key Words: AP-103, Tank Farms, Analytical Results, 241-AP-103, 3AP-97-1

Abstract: N/A

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Release Approval _____ Date 4/23/97



Approved for Public Release

HNH-SD-WM-DP-241, REV. 0

ANALYTICAL SERVICES

TANK 241-AP-103, GRAB SAMPLE 3AP-97-1
ANALYTICAL RESULTS FOR THE FINAL REPORT

Project Coordinator: RUTH A. ESCH

Prepared for the U.S. Department of Energy
Office of Environmental Restoration
and Waste Management

by

222-S Laboratory
Rust Federal Services of Hanford Inc.
P.O. Box 700
Richland, Washington

HNF-SD-WM-DP-241, REV. 0

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This Document consists of pages 1 through 33. Pages ii, 2, 7, 10, 13, 16, 19, were intentionally left blank.	

HNH-SD-WM-DP-241, REV. 0

NARRATIVE

HNF-SD-WM-DP-241, REV. 0

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222-S ANALYTICAL SERVICES

TANK 241-AP-103, GRAB SAMPLE 3AP-97-1
ANALYTICAL RESULTS FOR THE FINAL REPORT

This document is the final analytical laboratory report for the tank 241-AP-103 grab sample. One grab sample was collected from Riser 1@90° on March 19, 1997. Analyses were performed to verify compliance status with corrosion control criteria in accordance with the *Letter of Instruction for Tank 241-AP-103 Grab Sample Analyses* (LOI) (Field, 1997), the *Compatibility Grab Sampling and Analysis Plan* (TSAP) (Sasaki, 1997) and the *Data Quality Objectives for Tank Farms Waste Compatibility Program* (DQO) (Fowler, 1995).

The sample results for pH were less than 12 indicating that the tank contents were caustic deficient. A notification for low hydroxide (< 0.01 M) was made to East Tank Farms Operations based on the pH result.

Appearance and Sample Handling

The sample was received at the 222-S Laboratory on March 19, 1997 and was assigned the laboratory sample number S97T000394. The sample was a clear yellow liquid with approximately 1% settled solids in a 125 mL sample volume. There was no organic layer present. One liquid subsample was made for analysis (sample number S97T000400).

Analytical Results Summary

The Data Summary Report (Table 1) included in this document compiles the analytical results that comply with the analyses requested in the LOI.

pH

The pH analysis was performed on direct aliquots. This tank waste was suspected of low concentrations of hydroxide (OH^-) due to the amount of carbon dioxide absorption relative to the low volume of waste in the tank. Therefore, a pH measurement was requested rather than a hydroxide analysis in order to assess the caustic nature of the waste. The results were 9.89 and 9.90 for the sample and duplicate results, respectively. These results met the required quality control criteria.

Typically, a pH of 12 corresponds to an OH^- concentration of 0.01 M when there is no buffering of the solution. Therefore, since the pH results were less than 12, a notification was made to East Tank Farms Shift Operations for low OH^- (< 0.01 M), as indicated in the TSAP and the DQO as the lower limit for OH^- , regardless of the nitrate concentration.

OH⁻/Caustic Demand

As directed in the LOI, caustic demand analysis was performed rather than a free hydroxide analysis because the pH was less than 11.5. As mentioned in the previous section, this tank was suspected of low hydroxide concentrations. For corrosion control, the waste in the tank would require an adjustment of the hydroxide level to meet the minimum free hydroxide concentration of 0.01 M. Caustic demand was measured to determine the buffering capacity of the waste. This analysis indicates how much free hydroxide will be consumed by the waste, and what adjustment would be necessary to compensate for the OH⁻ consumed. The reported result of <0.147 moles OH⁻/L indicates that the waste in this tank has no buffering capacity.

Nitrate (NO₃⁻), Hydroxide (OH⁻) and Nitrite (NO₂⁻)

The results with respect to the waste compatibility corrosion rules are presented in Waste Compatibility Corrosion Rules (Table 2). Since the concentration of OH⁻ is less than 0.01 M (based on the pH), 0.0 μg/mL (0.0 M) was used for the purpose of these calculations. The table presents the NO₃⁻, OH⁻, and NO₂⁻ results in μg/mL and molarity (M) units. The spreadsheet compares the results to the concentration ranges specified in the TSAP and the waste compatibility DQO. A "YES" will appear in the appropriate space for the condition that is met. Only one of three sets of conditions must be met for OH⁻ and NO₂⁻ based on the range that the NO₃⁻ concentration falls in. If "NO" appears in the space under a condition, that condition is not met and a notification is required. As discussed in the pH section, a notification was required for the low OH⁻. The NO₂⁻ and NO₃⁻ results met the conditions for corrosion control.

IC - Ion Chromatography

The ion chromatography (IC) analysis was performed on the direct aliquot. The only analytes requested for this report were NO₂⁻ and NO₃⁻. All other analytes are reported as "opportunistic analyses" and no customer defined quality control review of those results are discussed in this report. The standard recovery, spike recovery and RPDs for NO₂⁻ and NO₃⁻ were within the required limits.

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Procedures

The analytical procedures used for performing the analyses are listed in Table 3. Abbreviations for analyses are defined in the table notes.

Table 3: Analytical Procedures

Analysis	Preparation Procedure	Analysis Procedure
pH	Direct Analysis	LA-212-106 Rev. B-0
Hydroxide Demand	Direct Analysis	LA-211-104 Rev. A-1
IC	Direct Analysis	LA-533-105 Rev. D-1

Abbreviations:

IC = ion chromatography

References

Field, J. G., 1997, *Letter of Instruction for Tank 241-AP-103 Grab Sample Analyses*, (letter 74610-97-033 to A. D. Rice, March 11), Lockheed Martin Hanford Corporation, Richland, WA 99352.

Fowler, K.D., 1995, *Data Quality Objectives for Tank Farms Waste Compatibility Program*, WHC-SD-WM-DQO-001, Rev. 1, Westinghouse Hanford Company, Richland, WA 99352.

Sasaki, L. M., 1997, *Compatibility Grab Sampling and Analysis Plan*, WHC-SD-TSAP-037, Rev. 0C, Lockheed Martin Hanford Corporation, Richland, WA 99352

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SAMPLE DATA SUMMARY

HNF-SD-WM-DP-241, REV. 0

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RISE: 1290
SEGMENT #: 3ap-97-1

Table 1: Data Summary Report
AP-103 GRAB

SEGMENT PORTION: Supernate

Sample#	R A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S97T000400		Caustic Demand	moles OH-/L	96.97	<42.00	<1.47e-1	<1.47e-1	n/a	n/a	n/a	1.47e-01	n/a
S97T000400		pH Direct	pH	100.3	n/a	9.890	9.900	9.895	0.10	n/a	1.00e-02	n/a
S97T000400		Fluoride-IC-Dionex 4000/4500	ug/mL	101.7	<1.20e-02	66.71	66.50	66.60	0.30	106.6	6.12e-01	n/a
S97T000400		Chloride-IC-Dionex 4000/4500	ug/mL	95.57	<1.70e-02	24.63	25.30	24.96	2.81	101.6	8.67e-01	n/a
S97T000400		Nitrite-IC - Dionex 4000/4500	ug/mL	99.63	<1.08e-01	9.48e+02	944.0	945.8	0.42	105.7	5.508	n/a
S97T000400		Bromide by Ion Chromatograph	ug/mL	100.2	<1.25e-01	< 6.375	<6.38e0	n/a	n/a	87.27	6.375	n/a
S97T000400		Nitrate by IC-Dionex 4000/4500	ug/mL	96.97	<1.39e-01	1.54e+03	1.54e+03	1.54e+03	0.00	102.7	7.089	n/a
S97T000400		Phosphate-IC-Dionex 4000/4500	ug/mL	95.41	<1.20e-01	55.90	50.30	53.10	10.5	91.56	6.120	n/a
S97T000400		Sulfate by IC-Dionex 4000/4500	ug/mL	102.1	<1.38e-01	2.98e+02	295.0	295.0	0.00	101.1	7.038	n/a
S97T000400		Oxalate by IC-Dionex 4000/4500	ug/mL	100.2	<1.05e-01	< 5.355	<5.35e0	n/a	n/a	100.2	5.355	n/a

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WASTE COMPATIBILITY CORROSION RULES

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Table 2: Waste Compatibility Corrosion Rules

Sample ID	Analyte	Result (ug/mL)	Result (M)			
S97T000400 Sample				$\leq 1.0 \text{ M?}$	$0.010 \text{ M} \leq [\text{OH}] \leq 8.0 \text{ M?}$	$0.011 \text{ M} \leq [\text{NO}_2] \leq 5.5 \text{ M}$
	NO ₃	1.54E+03	0.025	YES	NO	YES
	OH	0.00E+00	0.000			
	NO ₂	9.48E+02	0.021			
				$1.0 \text{ M} < [\text{NO}_3] \leq 3.0 \text{ M?}$	$0.1 \text{ M} * [\text{NO}_3] \leq [\text{OH}] < 10 \text{ M?}$	$[\text{NO}_2]/([\text{OH}] + [\text{NO}_3]) < 2.5?$
						$\geq 0.4 * [\text{NO}_3]?$
				$3.0 \text{ M} < [\text{NO}_3] \leq 5.5 \text{ M?}$	$0.3 \leq [\text{OH}] < 10 \text{ M?}$	$\geq 1.2 \text{ M?}$
S97T000400 Duplicate				$\leq 1.0 \text{ M?}$	$0.010 \text{ M} \leq [\text{OH}] \leq 8.0 \text{ M?}$	$0.011 \text{ M} \leq [\text{NO}_2] \leq 5.5 \text{ M}$
	NO ₃	1.54E+03	0.025	YES	NO	YES
	OH	0.00E+00	0.000			
	NO ₂	9.44E+02	0.021			
						$\geq 0.4 * [\text{NO}_3]?$
				$1.0 \text{ M} < [\text{NO}_3] \leq 3.0 \text{ M?}$	$0.1 \text{ M} * [\text{NO}_3] \leq [\text{OH}] < 10 \text{ M?}$	$[\text{NO}_2]/([\text{OH}] + [\text{NO}_3]) < 2.5?$
						$\geq 0.4 * [\text{NO}_3]?$
				$3.0 \text{ M} < [\text{NO}_3] \leq 5.5 \text{ M?}$	$0.3 \leq [\text{OH}] < 10 \text{ M?}$	$\geq 1.2 \text{ M?}$

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CHAIN OF CUSTODY FORMS

HNF-SD-WM-DP-241, REV. 0

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CHAIN-OF-CUSTODY RECORD FOR AUGER/GRAB SAMPLING

No. 1075
 14
 1:55 PM
 Mar. 19, 1997
 WHC 226 LAB ROOM 2F BACKSIDE

(1) Shipment Number 200E-08-17 (2) Sample Number * 3AR97-1 (3) Supervisor R.J. PEARNIK
 (4) Tank AP-103 (5) Riser 10 90° (6) Cask/PIG Shipping Container Serial Number 6003D

Radiation Survey Data For Cask/PIG:

Over Top Dose Rate

<0.5

Side Dose Rate

<0.5

Bottom Dose Rate

<0.5

Smearable Contamination

<20

(Alpha)

<1000

(Beta-Gamma)

RCT*

Sumner Wallace
(Signature)

(7) FIELD

(31) LABORATORY

<0.5

<0.5

<0.5

<20

(Alpha)

<1000

(Beta-Gamma)

RCT*

JP Morales
(Signature)

(8) Shipment Description

A. Work Package Number

ES-97-00114/G
2.149

B. Cask/PIG Seal Number

C. Date and Time Sample

3-19-96 / 1128 hr

Removed from Tank

D. Expected Liquid Content

100%

E. Expected Solid Content

100%

F. Dose Rate Through Drill String (Auger)/On Contact (GRAB)

50 mR/hr

G. Expected Sample Length (Auger)/Volume (GRAB)

125 m.

INFORMATION (Include statement of laboratory tests to be performed.)

(9) Field Comments

* Bottle Broke (original)
 2nd Sample bottle has NO
 19-96 Number...

(32) Laboratory Comments

Group# 97000206
 Sample# 97T000394

(1) Point of Origin

AP-103 10 90°

(12) Destination

222-S

(13) Sender Name (Sign and PRINT)

James Sickle James Sickle

(14) Date/Time

3-19-97

(15) Sender Comments

(7) Relinquished By (Sign and PRINT)

James Sickle James Sickle

(18) Received By (Sign and PRINT)

Sumner Wallace / Ginny Wallace

(19) Date/Time

3-19-97

(20) Receiver Comments

(1) Relinquished By (Sign and PRINT)

Sumner Wallace / Ginny Wallace

(22) Received By (Sign and PRINT)

Sam Knight / Sam Knight Jr

(23) Date/Time

3/19/97 1320

(24) Receiver Comments

(9) Relinquished By (Sign and PRINT)

(26) Received By (Sign and PRINT)

(27) Date/Time

(28) Receiver Comments

(16) Seal Intact Upon Release?

☒ Yes ☐ No

(29) Seal Intact Upon Receipt?

☒ Yes ☐ No

Shipment No.

☒ Yes ☐ No

Seal No.

☒ Yes ☐ No

Sample No.

☒ Yes ☐ No

(30) Seal Data Consistent with this Record?

DISTRIBUTION: White - Office of Sample Management Yellow - Recipient of Sample Pink - Waste Tank Sampling Goldenrod - Tank Farm Operations.

BC-6001-326 (01/98)

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SAMPLE HANDLING

HNF-SD-WM-DP-241, REV. 0

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LABCORE Data Entry Template for Worklist# 17122

Analyst: ADP Instrument: NONE Book #

Method: LA-519-151 Rev/Mod FO

Worklist Comment: @brkdw1 for AP-103 grab 3AP-97-1 (RECORD APPEANCE) RTS

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
5700206	AP-103 GRAB	1 SAMPLE	S97T000394	0	@BRKDW1 DOSERATE	LIQUID	N/A	<u>150</u>		mrad/hour
9700206	AP-103 GRAB	1 SAMPLE	S97T000394	0	@BRKDW1 APPEAR02	LIQUID	N/A	<u>Complete</u>		
9700206	AP-103 GRAB	1 SAMPLE	S97T000394	0	@BRKDW1 SAMPAMT2	LIQUID	N/A	<u>125mL</u>		mL

Final page for worklist # 17122

Anthony Parents 3-20-97
Analyst Signature Date

St. Peter 3-20-97
Analyst Signature Date

yellowish clear liquid
1% Solids
no phases

Reviewed By M/L AT
3/22/97

Data Entry Comments:

HNF-SD-WM-DP-241, REV. 0

INORGANIC ANALYSIS

HNF-SD-WM-DP-241, REV. 0

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worklistrpt Version 2.1 05/15/95
03/25/97 12:17

Page: 1

LABCORE Data Entry Template for Worklist# 17183

Analyst:

ADP

Instrument: PH01

Book #

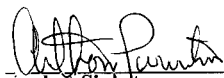
18N19-2^{ADP}C

Method: LA-212-106 Rev/Mod

B-O

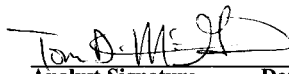
Worklist Comment: AP-103 GRAB, pH-01 skm

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STDPH			PH-01	LIQUID	<u>7.00</u>	<u>7.02</u>	<u>N/A</u>	pH
97000206	AP-103 GRAB	2 SAMPLE	S97T000400 0		PH-01	LIQUID	<u>N/A</u>	<u>9.89</u>		pH
97000206	AP-103 GRAB	3 DUP	S97T000400 0		PH-01	LIQUID	<u>9.89</u>	<u>9.90</u>	<u>N/A</u>	pH

Final page for worklist # 171833-25-97

Analyst Signature

Date

3/25/97

Analyst Signature

Date

Validated into Labcore by John McElroy 03/26/97

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number,
R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist# 17276

Analyst: raw Instrument: PH01 Book # 139Ni6B std
Method: LA-211-104 Rev/Mod A1 95N8A SPK

Worklist Comment: OHDEMAND FOR AP103 GRAB AND 2706-T. RTS

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			OHDEMAND	LIQUID	<u>3.302e-1</u>	<u>3.20e-1</u>	N/A	moles OH-/L
		2 BLNK			OHDEMAND	LIQUID	<u>1</u>	<u><42</u>	N/A	4g/ml CH ⁻
97000206	AP-103 GRAB	3 SAMPLE	S97T000400	0	OHDEMAND	LIQUID	N/A	<u><1.47e-1</u>	<u>1.47e-1</u>	moles OH-/L
97000206	AP-103 GRAB	4 DUP	S97T000400	0	OHDEMAND	LIQUID	<u><1.47e-1</u>	<u><1.47e-1</u>	N/A	moles OH-/L
97000211	2706-T	5 SAMPLE	S97TP000415	0	OHDEMAND	LIQUID	N/A	<1.47e-1	1.47e-1	moles OH-/L

Data not for this report

Final page for worklist # 17276

Sub Attached For Signature
Analyst Signature Date 3/28/97

rt Blah 4/1/97
Analyst Signature Date

approved RW Schroeder 4/2/97

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

worklistrpt Version 2.1 05/15/95
03/27/97 06:17

Page: 1

LABCORE Data Entry Template for Worklist# 17276

Analyst: RAW Instrument: PH01 WB 49375 Book # 139N16B STD
95N3A SPK

Method: LA-211-104 Rev/Mod _____

Worklist Comment: OHDEMAND FOR AP103 GRAB

RTS

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				OHDEMAND	LIQUID	_____	_____	N/A	moles OH-/L
		2	BLNK				OHDEMAND	LIQUID	_____	_____	N/A	moles OH-/L
97000206	AP-103 GRAB	3	SAMPLE	S97T000400	0		OHDEMAND	LIQUID	N/A	_____	_____	moles OH-/L
97000206	AP-103 GRAB	4	DUP	S97T000400	0		OHDEMAND	LIQUID	_____	_____	N/A	moles OH-/L

Final page for worklist # 17276

R. WENDLAND 3-28-97
 Analyst Signature Date

 Analyst Signature Date

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number.
 R = Replicate Number, A = Aliquot Code.

Caustic Demand WL# 17276

Prepared by RW Schoeden 3/31/97

Std

$$\text{OH}_{sp} = 1.0057 \text{ M} (0.050 \text{ ml}) = 0.05028 \text{ mmol}$$

$$\text{OH}_d = 0.2005 \text{ M} (0.171 \text{ ml}) = 0.03428 \text{ mmol}$$

$$\text{OH}_{con} = 0.05028 - 0.03428 = 0.0160 / 0.050 \text{ ml} = 0.3200 \text{ mol/L}$$

~~BK~~ $< 42 \text{ } \mu\text{g/mL OH}^-$

S97T000400

$$\text{OH}_{sp} = 1.0057 \text{ M} (0.050 \text{ ml}) = 0.05028 \text{ mmol}$$

$$\text{OH}_d = 0.2005 \text{ M} (0.240 \text{ ml}) = 0.04812 \text{ mmol}$$

$$\text{OH}_{con} = 0.05028 - 0.04812 = 0.00216 / 0.050 \text{ ml} = 4.32 \text{e-}2 \text{ mol/L}$$

~~DL = 0.0025 / 0.050~~ RWS 3/31/97

$$\text{DL} = 1.47 \text{e-}1$$

$$< 1.47 \text{e-}1 \text{ mol/L}$$

S97T000400 Dup

$$\text{OH}_{sp} = 1.0057 \text{ M} (0.050 \text{ ml}) = 0.05028 \text{ mmol}$$

$$\text{OH}_d = 0.2005 \text{ M} (0.246 \text{ ml}) = 0.04932 \text{ mmol}$$

$$\text{OH}_{con} = 0.05028 - 0.04932 = 0.000957 / 0.050 \text{ ml} = 1.91 \text{e-}2 \text{ mol/L}$$

$$\text{DL} = 1.47 \text{e-}1$$

$$< 1.47 \text{e-}1 \text{ mol/L}$$

S97TP00015

$$\text{OH}_{sp} = 1.0057 \text{ M} (0.050 \text{ ml}) = 0.05028 \text{ mmol}$$

$$\text{OH}_d = 0.2005 \text{ M} (0.229 \text{ ml}) = 0.045914 \text{ mmol}$$

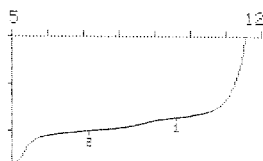
$$\text{OH}_{con} = 0.05028 - 0.04591 = 0.004365 / 0.050 \text{ ml} = 8.73 \text{e-}2$$

$$< 1.47 \text{e-}1 \text{ mol/L}$$

date 97-03-28 time 22:54
GET pH 12 # 14
Id.#1 1
Id.#2 .2005
pH(init) 11.54
V/ml pH
EP1 .171 9.62
EP2 .200 7.17
manual stop
=====

STD .050

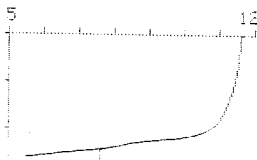
date 97-03-28 time 22:54
GET pH 12 # 14
.10ml/div dPH=1/div
start V .000 ml



date 97-03-28 time 23:01
GET pH 12 # 16
Id.#1 0
Id.#2 .2005
pH(init) 11.58
V/ml pH
EP1 .240 7.60
Manual stop
=====

ADD .050

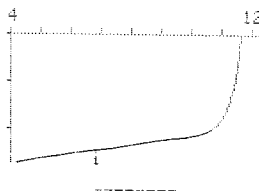
date 97-03-28 time 23:03
GET pH 12 # 16
.10ml/div dPH=1/div
start V .000 ml



date 97-03-28 time 23:12
GET pH 12 # 18
Id.#1 0
Id.#2 .2005
pH(init) 11.61
V/ml pH
EP1 .246 6.80
manual stop
=====

400 DUP .050

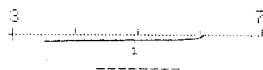
date 97-03-28 time 23:12
GET pH 12 # 18
.10ml/div dPH=1/div
start V .000 ml



date 97-03-28 time 22:56
GET pH 12 # 15
Id.#1 0
Id.#2 .2005
pH(init) 8.05
V/ml pH
EP1 .011 4.94
stop volt.reached
=====

BLK

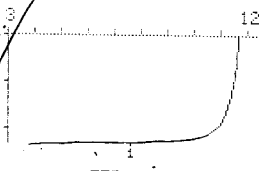
date 97-03-28 time 22:57
GET pH 12 # 15
.10ml/div dPH=1/div
start V .000 ml



date 97-03-28 time 23:15
GET pH 12 # 19
Id.#1 15
Id.#2 .2005
pH(init) 11.66
V/ml pH
EP1 .229 7.60
stop volt.reached
=====

15 .050

date 97-03-28 time 23:15
GET pH 12 # 19
.10ml/div dPH=1/div
start V .000 ml



use 4/18/97
Data not used

LABCORE Completed Worklist Report for Worklist# 17184

Analyst: kgh

Instrument: IC01

Book# SDN2DA

Method: LA53305 Rev/Mod D-1

Worklist Comment: AP-103 GRAB, @IC-01 skm

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	CCB	0	@IC-QC F	QC	1	<1.20e-2		ug/mL
1	CCB	0	@IC-QC CL	QC	1	<1.70e-2		ug/mL
1	CCB	0	@IC-QC NO2	QC	1	<1.08e-1		ug/mL
1	CCB	0	@IC-QC BR	QC	1	<1.25e-1		ug/mL
1	CCB	0	@IC-QC NO3	QC	1	<1.39e-1		ug/mL
1	CCB	0	@IC-QC PO4	QC	1	<1.20e-1		ug/mL
1	CCB	0	@IC-QC SO4	QC	1	<1.38e-1		ug/mL
1	CCB	0	@IC-QC OXALATE2	QC	1	<1.05e-1		ug/mL
2	CCV	0	@IC-QC F	QC	5.90e01	6.00e+01	101.695 %	Recovery
2	CCV	0	@IC-QC CL	QC	7.90e01	7.55e+01	95.570 %	Recovery
2	CCV	0	@IC-QC NO2	QC	5.43e02	5.41e+02	99.632 %	Recovery
2	CCV	0	@IC-QC BR	QC	5.89e02	5.90e+02	100.170 %	Recovery
2	CCV	0	@IC-QC NO3	QC	5.94e02	5.76e+02	96.970 %	Recovery
2	CCV	0	@IC-QC PO4	QC	5.45e02	5.20e+02	95.413 %	Recovery
2	CCV	0	@IC-QC SO4	QC	6.31e02	6.44e+02	102.060 %	Recovery
2	CCV	0	@IC-QC OXALATE2	QC	5.32e02	5.33e+02	100.188 %	Recovery
3	SAMPLE	S97T000400	@IC-01 F-02	LIQUID	N/A	6.671e+01	0.612	ug/mL
3	SAMPLE	S97T000400	@IC-01 CL-02	LIQUID	N/A	2.463e+01	0.867	ug/mL
3	SAMPLE	S97T000400	@IC-01 NO2-02	LIQUID	N/A	9.475e+02	5.508	ug/mL
3	SAMPLE	S97T000400	@IC-01 BR-02	LIQUID	N/A	6.375e+00	6.375	ug/mL
3	SAMPLE	S97T000400	@IC-01 NO3-02	LIQUID	N/A	1.543e+03	7.089	ug/mL
3	SAMPLE	S97T000400	@IC-01 PO4-02	LIQUID	N/A	5.590e+01	6.120	ug/mL
3	SAMPLE	S97T000400	@IC-01 SO4-02	LIQUID	N/A	2.950e+02	7.038	ug/mL
3	SAMPLE	S97T000400	@IC-01 OXALATE2	LIQUID	N/A	5.355e+00	5.355	ug/mL
4	DUP	S97T000400	@IC-01 F-02	LIQUID	6.67e+01	6.65e+01	0.300	RPD
4	DUP	S97T000400	@IC-01 CL-02	LIQUID	2.46e+01	2.53e+01	2.806	RPD
4	DUP	S97T000400	@IC-01 NO2-02	LIQUID	9.48e+02	9.44e+02	0.423	RPD
4	DUP	S97T000400	@IC-01 BR-02	LIQUID	<6.38e0	<6.38e0		RPD
4	DUP	S97T000400	@IC-01 NO3-02	LIQUID	1.54e+03	1.54e+03	0.000	RPD
4	DUP	S97T000400	@IC-01 PO4-02	LIQUID	5.59e+01	5.03e+01	10.546	RPD
4	DUP	S97T000400	@IC-01 SO4-02	LIQUID	2.95e+02	2.95e+02	0.000	RPD
4	DUP	S97T000400	@IC-01 OXALATE2	LIQUID	<5.36e0	<5.35e0		RPD
5	SPK	S97T000400	@IC-01 F-02	LIQUID	5.90e01	6.29e+01	106.610 %	Recovery
5	SPK	S97T000400	@IC-01 CL-02	LIQUID	7.90e01	8.03e+01	101.646 %	Recovery
5	SPK	S97T000400	@IC-01 NO2-02	LIQUID	5.43e02	5.74e+02	105.709 %	Recovery
5	SPK	S97T000400	@IC-01 BR-02	LIQUID	5.89e02	5.14e+02	87.267 %	Recovery
5	SPK	S97T000400	@IC-01 NO3-02	LIQUID	5.94e02	6.10e+02	102.694 %	Recovery
5	SPK	S97T000400	@IC-01 PO4-02	LIQUID	5.45e02	4.99e+02	91.560 %	Recovery
5	SPK	S97T000400	@IC-01 SO4-02	LIQUID	6.31e02	6.38e+02	101.109 %	Recovery
5	SPK	S97T000400	@IC-01 OXALATE2	LIQUID	5.32e02	5.33e+02	100.188 %	Recovery

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Completed Worklist Report for Worklist# 17184

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
-----	------	---------	---	---	------	--------	--------	-------	-------------	------

Final page for worklist# 17184

Analyst Signature Date

Analyst Signature Date

Heather Anasto 4.8.97
Reviewer Signature Date

03/25/97 12:23

A-0004-1

Page: 1

LABCORE Data Entry Template for Worklist# 17184Analyst: KAD Instrument: IC0 1Book# 501620-CMethod: LA-533-105 Rev/Mod D-1

Worklist Comment: AP-103 GRAB, @IC-01 skm

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 CCB			@IC-QC	QC		
2 CCV			@IC-QC	QC		
3 SAMPLE	S97T000400 0		@IC-01	LIQUID	97000206	AP-103 GRAB
	Analytes Requested: BR-02 , CL-02 , F-02 , NO2-02 , NO3-02 , OXALATE2, PO4-02 , SO4-02					
4 DUP	S97T000400 0		@IC-01	LIQUID		
5 SPK	S97T000400 0		@IC-01	LIQUID		

Final page for worklist # 17184

Analyst Signature

Date

Analyst Signature

Date

Up-loaded 4-4-97

J. A. W. well

17184 APR. CSV

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

A-0010-IC				DATA FILE/WORKLIST RESOLUTION				04-Apr-97			
Worklist#: 17184				Data File: 17184APR.CSV							
		Seq	Type	Sample #		Seq#	Data File	Sample Name	Dilution		
-	=>	1	CCB		-	1	97040371.d01	BLANK	1.00		
	=>	2	CCV			2	97040371.d02	50N20-A STD	101.00		
	=>	3	SAMPLE	S97T000400		3	97040371.d05	S97T000400 SAM	51.00		
	=>	4	DUP	S97T000400		4	97040371.d06	S97T000400 DUP	51.00		
	=>	5	SPK	S97T000400		5	97040371.d07	S97T000400 SPK	51.00		
+					+						

Save (F4) Abort (Shift-F3) ListFiles (Shift-F1) UploadFile (F8)

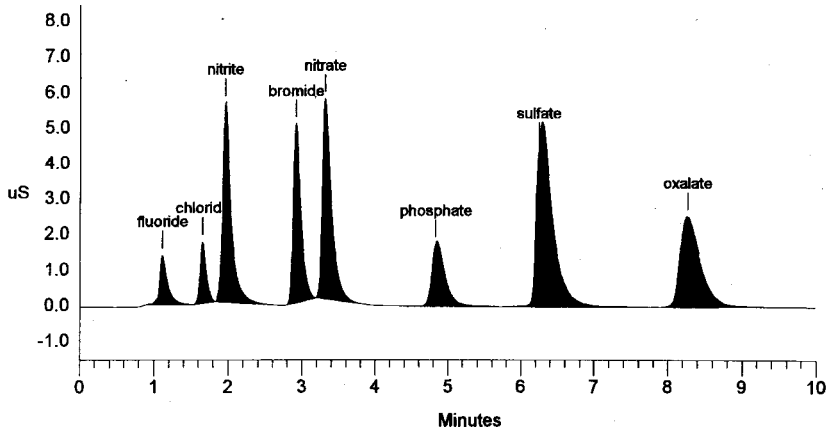
Sample Name: 50N20-A STD Date: 04/03/1997 20:06:27
 Data File : C:\DX\DATA\97040371.D02
 Method : C:\DX\METHOD\RIT.MBT HNF-SD-WM-DP-241, REV.0
 ACI Address: 1 System: 1 Inject#: 2 Detector: CDM-1
 Analyst : *[Signature]* Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	101	3000	5Hz	0.00	10.00		50

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.11	fluoride	59.962	1386	10586	1	2.14
2	1.65	chloride	75.541	1726	9482	1	1.22
3	1.95	nitrite	540.725	5601	43423	1	-1.35
4	2.91	bromide	589.745	5022	35724	1	1.16
5	3.31	nitrate	576.025	5631	47939	1	3.33
6	4.83	phosphate	519.653	1738	22860	1	1.69
7	6.24	sulfate	644.238	4485	77779	1	0.86
8	8.27	oxalate	533.246	2532	47567	1	1.97
Totals			3539.134	28121	295360		

File: 97040371.D02 Sample: 50N20-A STD



SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 29 TO 33.

```

=====
Sample Name: BLANK                      Date: 04/03/1997 19:28:15
Data File  : C:\DX\DATA\97040371.D01
Method     : C:\DX\METHOD\KIT.MET      HNF-SD-WM-DP-241, REV. 0
ACI Address: 1 System: 1 Inject#: 1      Detector: CDM-1
Analyst    :                          Column: AG4A/AS4A anion column
=====

```

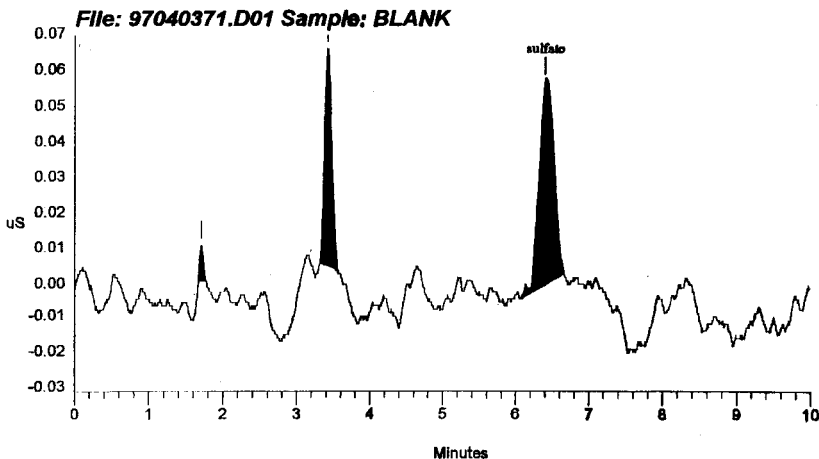
```

=====
Calibration Volume  Dilution Points Rate  Start  Stop Area Reject
-----
External           1           1  3000  5Hz   0.00  10.00      50
=====

```

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
2	3.42	nitrate	0.038	61	425	1	6.88
3	6.40	sulfate	-0.053	57	827	1	3.45
Totals			-0.015	118	1252		



```

=====
Sample Name: S97T000400 SAM                      Date: 04/03/1997 22:35:37
Data File : C:\DX\DATA\97040371.D05              HNF-SD-WM-DP-241, REV. 0
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 5                Detector: CDM-1
Analyst : Column: AG4A/AS4A anion column
=====

```

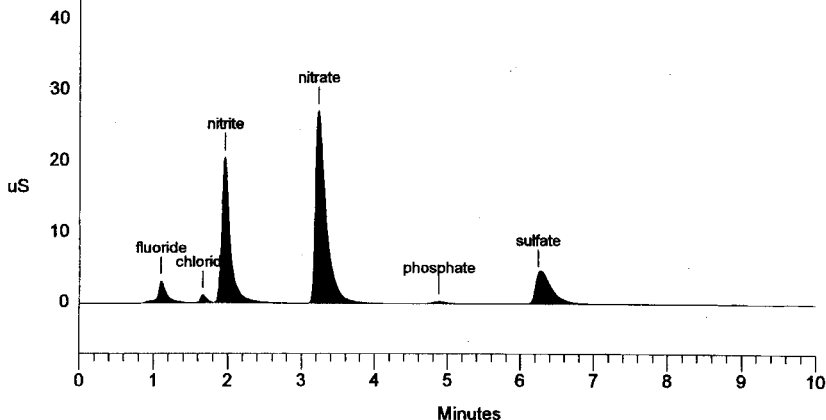
Calibration Volume Dilution Points Rate Start Stop Area Reject

External 1 51 3000 5Hz 0.00 10.00 50

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.10	fluoride	66.711	3074	24527	1	0.92
2	1.66	chloride	24.634	1112	6070	1	1.63
3	1.96	nitrite	947.473	20468	158946	1	-1.01
4	3.23	nitrate	1543.299	27059	269197	1	0.83
5	4.88	phosphate	55.897	325	4654	1	2.81
6	6.24	sulfate	294.984	4224	70554	1	0.86
Totals			2932.998	56262	533948		

File: 97040371.D05 Sample: S97T000400 SAM



```

=====
Sample Name: S97T000400 DUP                      Date: 04/03/1997 22:48:37
Data File  : C:\DX\DATA\97040371.D06
Method     : C:\DX\METHOD\KIT.MET                HNF-SD-WM-DP-241, REV. 0
ACI Address: 1 System: 1 Inject#: 6                Detector: CDM-1
Analyst    :                                     Column: AG4A/AS4A anion column
=====

```

```

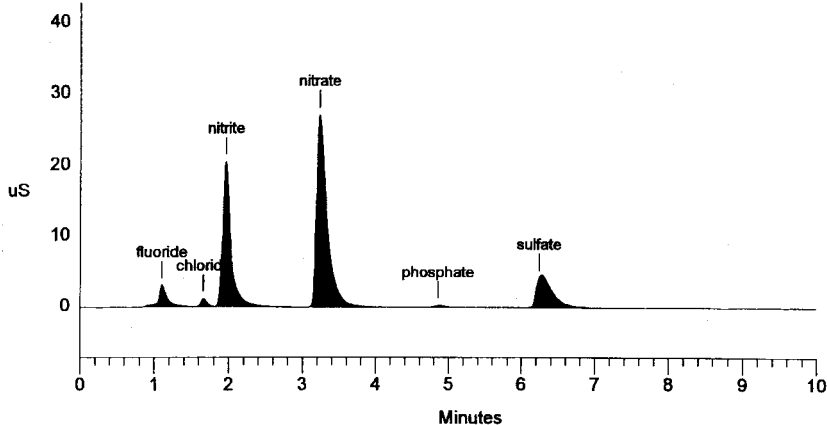
=====
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          51  3000  5Hz  0.00 10.00          50
=====

```

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.10	fluoride	66.548	3052	24464	1	0.92
2	1.66	chloride	25.308	1133	6239	1	1.63
3	1.96	nitrite	943.602	20490	158256	1	-1.01
4	3.23	nitrate	1543.944	27091	269319	1	0.83
5	4.85	phosphate	50.259	288	4163	1	2.25
6	6.24	sulfate	294.670	4217	70479	1	0.86
Totals			2924.331	56271	532919		

File: 97040371.D06 Sample: S97T000400 DUP



```

=====
Sample Name: S97T000400 SPK                      Date: 04/03/1997 23:00:01
Data File  : C:\DX\DATA\97040371.D07
Method     : C:\DX\METHOD\KIT.MET                HNF-SD-WM-DP-241, REV. 0
ACI Address: 1 System: 1 Inject#: 7                Detector: CDM-1
Analyst    :                                     Column: AG4A/AS4A anion column
=====

```

```

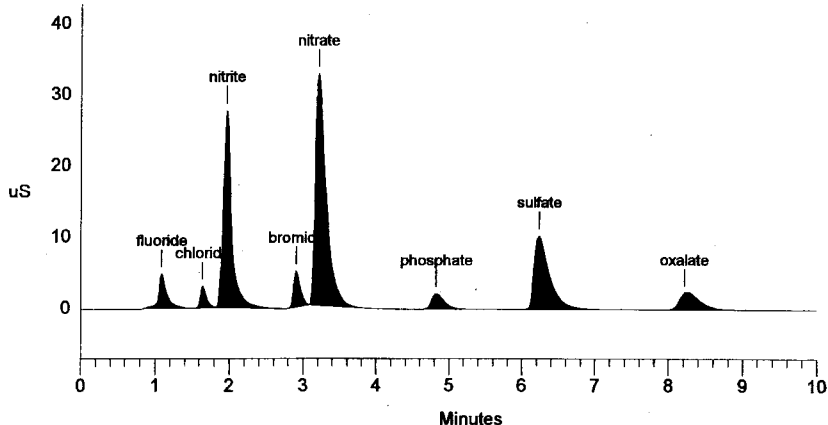
=====
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          51 3000 5Hz 0.00 10.00          50
=====

```

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.09	fluoride	98.175	4810	36993	1	0.31
2	1.64	chloride	64.789	2970	16337	1	0.41
3	1.96	nitrite	1234.466	27672	211094	1	-1.01
4	2.91	bromide	256.831	5002	30644	1	1.16
5	3.21	nitrate	1848.448	32534	327618	1	0.21
6	4.83	phosphate	305.403	2149	26703	1	1.69
7	6.24	sulfate	614.222	10276	147827	1	0.86
8	8.21	oxalate	266.718	2262	47110	1	1.32
Totals			4689.053	87674	844325		

File: 97040371.D07 Sample: S97T000400 SPK



DISTRIBUTION SHEET

To Distribution	From Production Planning & Control	Page 1 of 1
		Date: 04/18/97

HNF KMB 4/19/97	Project Title/Work Order WHG-SD-WM-DP-241, Rev. 0 "Tank 241-AP-103, Grab Sample, 3AP-97-1 Analytical Results for the Final Report	EDT NO.: EDT-620394
		ECN NO.: N/A

Name	MSIN	Text With all Attach	EDT/ECN ONLY	
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DE&S Hanford, Inc.

J. E. Meacham	S7-14	X		
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U.S. Department of Energy, RL

C. A. Babel	S7-54	X		
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J. A. Poppiti	S7-54	X		
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Lockheed Martin Hanford Corp.

J. N. Appel	G3-21		X	
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T. J. Kelley	S7-21		X	
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N. W. Kirch	R2-11	X		
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M. J. Kupfer	H5-49		X	
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J. B. Schaffer	R2-12		X*	
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L. A. Stauffer	R2-11	X		
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R. R. Thompson	R2-12	X		
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J. A. Voogd	H5-03		X	
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A. E. Young	R2-12	X		
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J. G. Field	R2-12	X		
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T. M. Blaak	S5-13	X		
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Lockheed Martin Services, Inc.

Central Files	A3-88	2		
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Los Alamos Technical Associates

M. T. Ellsworth	T6-06		X*	
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Rust Federal Services of Hanford, Inc.

M. W. Barnes	T6-16	X		
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R. A. Esch	T6-06	X		
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D. C. Hetzer	S6-31		X	
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K. L. Powell	T6-04		X	
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C. M. Seidel	T6-04	X		
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LTIC	T6-03		X	
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* Needs only releasing paperwork, not a copy of the released document.