

WS#14
16

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1	HNF-1646	N/A	0	K Basin Sandfilter Backwash Line Characterization Project Analytical Results for Campaign 15	Q	2	1	1

16. KEY		
Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D or N/A (see WMC-CM-3-5, Sec.12.7)	1. Approval 2. Release 3. Information Required	4. Review 5. Post-Review 6. Dist. (Receipt Acknow.)
		1. Approved 2. Approved w/comment 3. Disapproved w/comment
		4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledge

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)									
(G) Reason	(H) Disposition	(J) Name	(K) Signature (M) MSIN	(L) Date	(G) Reason	(H) Disposition	(J) Name	(K) Signature (M) MSIN	(L) Date
		Design Authority							
		Design Agent							
2		Cog. Eng. F. H. Steen	<i>F. H. Steen</i>	9/25/98					
2		Cog. Mgr. B. B. Hardy	<i>B. B. Hardy</i>	9/25/98					
2		QA T. L. Tung	<i>T. L. Tung</i>	9/25/98					
		Safety							
		Env.							

18. Signature of ED Originator <i>L. A. Diaz</i> Date: <i>9/25/98</i>		19. Authorized Representative Date for Receiving Organization N/A		20. Design Authority Date Cognizant Manager <i>B. B. Hardy</i> Date: <i>9/25/98</i>		21. DOE APPROVAL (if required) Ctrl. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments	
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K Basin Sandfilter Backwash Line Characterization Project, Analytical Results for Campaign 15

Franciska H. Steen
Waste Management of Hanford, Inc., Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

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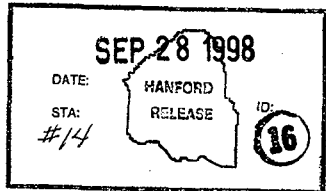
Key Words: K Basin Backwash, Campaign 15, Charactization Project, K Basin, Analytical Results, Final Report

Abstract: N/A

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Franciska H. Steen
Release Approval Date 9/25/98



Approved for Public Release

HNF-1646 REV. 0

WASTE MANAGEMENT LABORATORY

**K BASIN SANDFILTER BACKWASH LINE
CHARACTERIZATION PROJECT
ANALYTICAL RESULTS FOR CAMPAIGN 15**

Project Coordinator: Franciska H. Steen

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

by

**222-S Laboratory
Waste Management of Hanford, Inc.
P.O. Box 700
Richland, Washington**

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HANFORD ANALYTICAL LABORATORY OPERATIONS

**K BASIN SANDFILTER BACKWASH LINE
CHARACTERIZATION PROJECT,
ANALYTICAL RESULTS FOR CAMPAIGN 15**

Summary

Sample 183KWBMF was taken from the K West Sandfilter Backwash Pit on August 28, 1998 and received by 222-S Laboratory on August 28, 1998. Analyses were performed in accordance with *Letter of Instruction for K Basins Sandfilter Backwash Line Samples (LOI)* in support of the K Basin Sandfilter Backwash Line Characterization Project.

Appearance and Sample Handling

Sample 183KWBMF consisted of 250 milliliters of clear liquid with a small amount of black solids on the bottom of the container. Table 1 summarizes appearance information and over-the-top (OTR) dose readings performed on the sample.

Table 1. Appearance and OTR for K W Basin Sandfilter Backwash Sample

Customer ID	Lab ID	Color	Clarity	Organic Layer	Solids	OTR (MRAD/HR)
183KWBMF	S98K000003	None	Clear	None	Black	<0.5

Sample Preparation

There were no anomalies observed nor exceptions to the data precision and accuracy requirements stated in LOI for the digestion of the sample. The K Basin Sample Digestion Data Sheet (Table 2) compiles analytical results associated with the digestion process. Determination of Data Correction Digestion/Dilution Factors (Table 3) presents the data used to determine the digestion/dilution conversion factor and the final calculated value.

Attachment 1 (Sample Processing Scheme for K West Basin Sandfilter Backwash Line Sample 183KWBMF) illustrates the digestion process. Furthermore, this reference relates K West Basin identification numbers to their corresponding 222-S Laboratory Information Management System sample numbers.

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Sample 183KWBMF was entered into the 222-S Laboratory Information Management System (LABCORE) as a solid sample. In order to satisfy the LABCORE upload of the raw data, a digest factor of 1g/L was used to convert the units for the results from uCi/L to uCi/g. Therefore, the uCi/g data results are equal to the uCi/L data results. The uCi/L results were converted to uCi/mL on Tables 4, 5, 6 and 7. The volume and weight correction factors were also applied in order to correct the data results to the original sample.

Analytical Results

The data summary tables included in this report compile analytical results associated with each sample. Results are reported as activity of the digestate (S98K000003). These results were corrected for volume and weight of the entire sample. Analytical results for the digestate are presented in Table 4. Analytical results corrected to the original sample volume are presented in Tables 5, 6 and 7. These tables present an estimated quantification limit (EQL) for each analysis. An EQL is equivalent to a practical quantification limit (as required by LOI) and is calculated as the method detection limit multiplied by any dilution factor and by a factor of ten.

Plutonium (238 Pu and 239/240Pu)

There were no anomalies observed during sample analysis. The detection limit was much less than the customer specified detection limit of 4.2 $\mu\text{Ci/L}$. The preparation blank did not show contamination. Standard recovery, precision, and accuracy were all within acceptable limits.

Uranium (U)

There were no anomalies observed during sample analysis. The detection limit was much less than the customer specified detection limit of 23 mg/L. The preparation blank did not show contamination. Standard recovery, precision, and accuracy were all within acceptable limits.

Procedures

Table 8 lists the analytical procedures used for performing sample analyses.

Table 8. Analytical Procedures

Analysis	Preparation Procedure	Analysis Procedure
Pu 238 and Pu239/240	LA-505-162 Rev. C-0	LA-953-104 Rev. B-0
U	LA-505-162 Rev. C-0	LA-925-009 Rev. C-0

References

DeFigh-Price, C., October 1996, *Letter of Instruction for K Basins Sandfilter Backwash Line Samples*, Revision 3, Internal Memorandum 2A100-96.018.

Markel, L.P., 1997, *222-S Laboratory Quality Assurance Plan*, HNF-SD-CP-QAPP-016, Rev. 2, Rust Federal Services of Hanford, Inc., Richland, WA 99352.

Table 2. Sample Digestion Data Sheet (LA-505-162, Revision C-0)

Step	Labcore Name	Parameter Description	Units	Datum
9.1.2.1		Labcore Sample Number	n/a	S98R000003
9.1.2.2	ESTVOL01	Estimated total volume of sample	ml.	260
9.1.2.3	DOSE-02	Dose rate window closed	mR/hr	<0.5
9.1.2.3	WODOSE02	Dose rate window open	mrad/hr	<0.5
9.1.4	GROSSWT1	Gross weight of sample bottle and contents	grams	314.826
9.1.7	TAREWT01	Tare weight of PTFE drying/digesting vessel	grams	121.237
9.2.5	TAREWT02	Tare weight of empty dried sample bottle	grams	33.468
9.2.8	REFILLWT	Tare weight of bottle refilled to initial liquid level	grams	314.906
9.2.10	DRYWT-01	Weight of bottle refilled to initial liquid level	grams	121.243
9.2.12	DRYWT-02	Gross weight of drying vessel, 1st drying	grams	121.243
9.2.13.1	AVENETWT	Gross weight of drying vessel, 2nd drying	grams	121.243
9.2.14	DRYWT-03	Average of net weight of dried sludge	grams	0.008
9.2.15	NETWT-01	Gross weight of drying vessel, 3rd drying	grams	121.243
9.2.16.2	TAREWT03	Net weight of dried sludge	grams	0.008
9.2.16.4	GROSSWT2	Tare weight of bottle for sludge storage	grams	0.0000
9.2.16.5	NETWT-02	Gross weight of excess dry sludge + storage container	grams	0.0000
9.2.16.6	GROSSWT3	Net weight of excess dried sludge	grams	0.0000
9.2.16.7	NETWT-03	Gross weight of remaining dried sludge to be digested plus drying vessel	grams	121.243
9.2.17	NETWT-04	Net weight of remaining dried sludge to be digested	grams	0.006
9.2.31.3	VOLDIG01	Net weight of dried sludge to be digested	grams	0.006
9.2.31.5	KOIG-01	Volume of diluted digestate (same as volume of volumetric flask)	ml	100
9.2.35	GROSSWT4	Digestion Factor		0.3546
9.2.36	APPEAR02	Gross weight of dry digesting vessel plus residue	grams	121.243
9.2.37	CHILD-01	Appearance of dried residue	n/a	Disolved
		LABCORE number of digestate	n/a	n/a

**Table 3. Determination of Data Correction Digestion/Dilution Factors
K Basin Sand Filter Backwash Line
Campaign 15**

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9*
Customer Sample Number	Labcore Parent Sample Number	Sample Bottle Gross Weight grams	Bottle Tare Weight grams	Density Factor	Initial Sample Volume (converted by density) milliliters	Weight of Digested Sludge grams	Volume of Digestate (Vol flask volume) milliliters	Digestion Factor Volume (mL) and weight (g)
183KWBMF	S98K000003	314.906	33.468	0.996	282.002	0.0060	100.0	3.56E-01

Column 3. Derived from step 8.2.8 of LA-505-162, Rev. C-0.

Column 4. Derived from step 8.2.5 of LA-505-162, Rev. C-0.

Column 5. Density of reagent grade water at room temperature.

Column 6. Calculation: (column 3 - column 4) ÷ column 5.

Column 7. Derived from step 8.2.17 of LA-505-162, Rev. C-0.

Column 8. Derived from step 8.2.31.3 of LA-505-162, Rev. C-0.

Column 9. Calculation: (column 8 / column 6). Digestion factor to correct to total volume and weight to solids in original sample.

Note: Since all solids were digested, Column 7 is both the weight of solids digested and the original weight of the dried solids. Thus, the ratio is 1.

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**Table 4. Analytical Results for Digestates
K Basin Sand Filter Backwash Line
Campaign 15**

Digestate Results Not Corrected for Digestion Factors or Dilution Factors

**Pu-238 by TRU-SPEC Resin
LA-953-104**

SAMPLE IDENTIFICATION			SAMPLE RESULTS			QUALITY CONTROL DATA					
Customer Sample Number	Laboratory Sample Number	Campaign Number	Sample Result uCi/L	Duplicate Result uCi/L	Mean Result uCi/L	Standard % Recovery	Preparation Blank uCi/L	Precision of Duplicate RPD	Accuracy of Spike % Recovery	Detection Limit uCi/L	Counting Error, Relative %
183KWBMF	S98K000003	15	4.55E-03	5.33E-03	4.94E-03	N/A	<3.07-3	17.1	N/A	4.07E-03	6.6

**Pu-239/240 by TRU-SPEC Resin
LA-953-104**

SAMPLE IDENTIFICATION			SAMPLE RESULTS			QUALITY CONTROL DATA					
Customer Sample Number	Laboratory Sample Number	Campaign Number	Sample Result uCi/L	Duplicate Result uCi/L	Mean Result uCi/L	Standard % Recovery	Preparation Blank uCi/L	Precision of Duplicate RPD	Accuracy of Spike % Recovery	Detection Limit uCi/L	Counting Error, Relative %
183KWBMF	S98K000003	15	2.07E-02	2.05E-02	2.06E-02	111.6	<3.07E-3	1.0	90.2	4.07E-03	3.4

**Uranium by Phosphorescence
LA-925-009**

SAMPLE IDENTIFICATION			SAMPLE RESULTS			QUALITY CONTROL DATA					
Customer Sample Number	Laboratory Sample Number	Campaign Number	Sample Result ug/L	Duplicate Result ug/L	Mean Result ug/L	Standard % Recovery	Preparation Blank ug/L	Precision of Duplicate RPD	Accuracy of Spike % Recovery	Detection Limit ug/L	Relative Percent Uncertainty
183KWBMF	S98K000003	15	1.77E+02	1.72E+02	1.75E+02	95.9	3.70E-01	2.9	94.0	3.70E-01	1.3

**Table 5. Analytical Results Corrected to Original Sample Volume: Pu-238 by TRU-SPEC Resin
K Basin Sand Filter Backwash Line
Campaign 15**

Data are Corrected for Digestion Factors and Dilution Factors

**Pu-238 by TRU-SPEC Resin
LA-953-104**

SAMPLE IDENTIFICATION			SAMPLE RESULTS								QUALITY CONTROL DATA					
Customer Sample Number	Laboratory Sample Number	Campaign Number	Conversion Factor to uCi/mL	Digestate Sample Result uCi/L	Final Sample Result uCi/mL	Digestate Duplicate Result uCi/L	Final Duplicate Result uCi/mL	Digestate Mean Result uCi/L	Final Mean Result uCi/mL	Digestate Preparation Blank uCi/L	Final Preparation Blank uCi/mL	Precision of Duplicate RPD	Digestate Detection Limit uCi/L	Final Detection Limit uCi/mL	Estimated Quantitation Limit uCi/mL	Relative Percent Counting Error
183KWBMF	S98K000001	15	3.56E-01	4.55E-03	1.62E-06	5.33E-03	1.90E-06	4.94E-03	1.76E-06	<3.07E-3	<3.07E-6	17.1	4.07E-03	4.07E-06	4.07E-05	6.6

Notes: The detection limit and relative percent counting error are based on the sample results.

"Final" refers to the result as it pertains to the original sample volume, calculated by multiplying the digestate results by the conversion factor and dividing this number by 1000 to convert uCi/L to uCi/mL.

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Table 6. Analytical Results Corrected to Original Sample Volume; Pu-239/240 by TRU-SPEC Resin
K Basin Sand Filter Backwash Line
Campaign 15
Data are Corrected for Digestion Factors and Dilution Factors

Pu-239/240 by TRU-SPEC Resin
LA-863-104

SAMPLE IDENTIFICATION			SAMPLE RESULTS							QUALITY CONTROL DATA								
Customer Sample Number	Laboratory Sample Number	Campaign Number	Conversion Factor to uCi/mL	Digestate Sample Result uCi/L	Final Sample Result uCi/mL	Digestate Duplicate Result uCi/L	Final Duplicate Result uCi/mL	Digestate Mean Result uCi/g	Final Mean Result uCi/mL	Standard % Recovery	Digestate Preparation Blank uCi/L	Final Preparation Blank uCi/mL	Precision of Duplicate RPD	Accuracy of Spike % Recovery	Digestate Detection Limit uCi/L	Final Detection Limit uCi/mL	Estimated Quantification Limit uCi/mL	Relative Percent Counting Error
104KVBMP	S98K000001	15	3.56E-01	2.07E-02	7.37E-06	2.05E-02	7.30E-06	2.06E-02	7.33E-06	111.6	<3.07E-3	<3.07E-6	1.0	90.2	4.07E-03	1.45E-06	1.45E-05	3.4

Notes: The detection limit and relative percent counting error are based on the sample results.

"Final" refers to the result as it pertains to the original sample volume, calculated by multiplying the digestate results by the conversion factor and dividing this number by 1000 to convert uCi/L to uCi/mL.

**Table 7. Analytical Results Corrected to Original Sample Volume: Uranium by Phosphorescence
K Basin Sand Filter Backwash Line
Campaign 15
Data are Corrected for Digestion Factors and Dilution Factors**

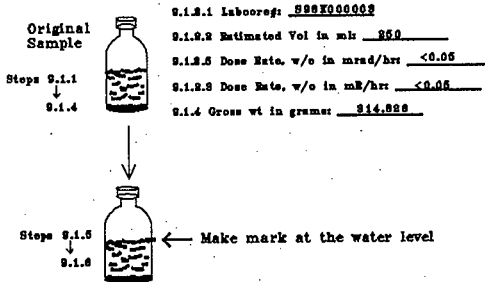
**Uranium by Phosphorescence
LA-925-009**

SAMPLE IDENTIFICATION			SAMPLE RESULTS								QUALITY CONTROL DATA							
Customer Sample Number	Laboratory Sample Number	Campaign Number	Conversion Factor	Digestate Sample Result ug/L	Final Sample Result ug/mL	Digestate Duplicate Result ug/L	Final Duplicate Result ug/mL	Digestate Mean Result ug/L	Final Mean Result ug/mL	Standard % Recovery	Digestate Preparation Blank ug/L	Final Preparation Blank ug/mL	Precision of Duplicate RPD	Accuracy of Spike % Recovery	Digestate Detection Limit ug/L	Final Detection Limit ug/mL	Estimated Quantitation Limit uCi/mL	Relative Percent Uncertainty
104KWBMF	S98K000001	15	3.56E-01	1.77E+02	6.30E-02	1.72E+02	6.12E-02	1.75E+02	6.21E-02	95.9	3.70E-01	1.32E-04	2.9	94.0	3.70E-01	1.32E-04	1.32E-03	1.3

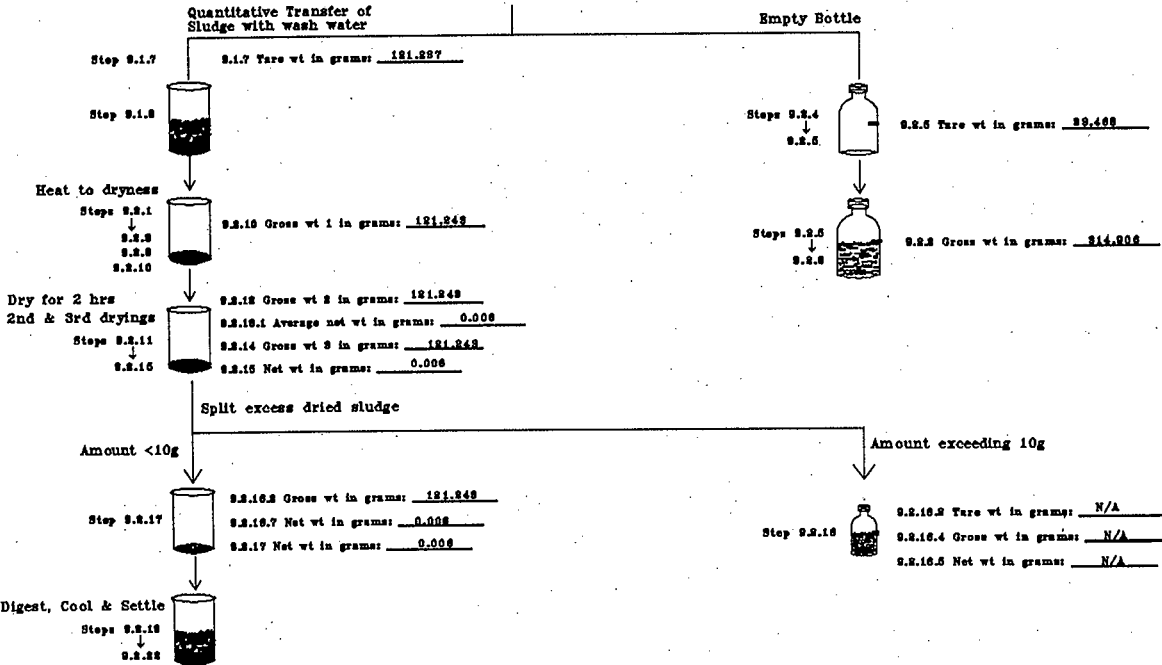
Note: The detection limit and relative percent uncertainty are based on the sample results.

"Final" refers to the result as it pertains to the original sample volume, calculated by multiplying the digestate results by the conversion factor and dividing by 1000 to convert uCi/L to uCi/mL.

Attachment 1. Sample Processing Scheme for K-E Basin SFBWL Sludge per LA-505-182



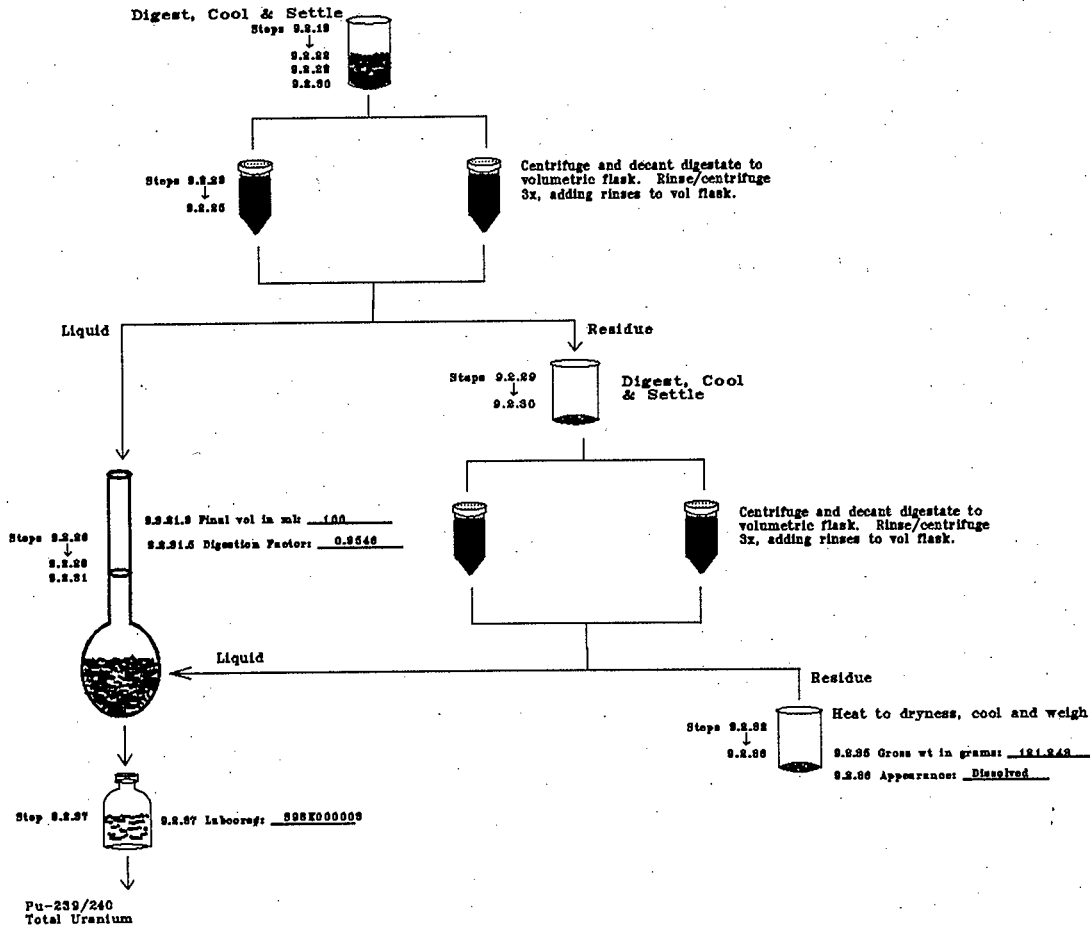
9.1.2.1 Laboreqs: SSSFO00002
 9.1.2.2 Estimated Vol in ml: 250
 9.1.2.3 Dose Rate, w/o in mrad/hr: <0.05
 9.1.2.3 Dose Rate, w/o in mR/hr: <0.05
 9.1.4 Gross wt in grams: 314.828



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Sample Processing Scheme for K-E Basin SFBWL Sludge per LA-505-182, continued



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* TSR REQUIREMENT *

REQUEST FOR SAMPLE ANALYSIS (RSA)

1. Sample Origin 105 KW					2. Date Sampled 8-28-98		4. Requestor's Name M.A. Green		6. TPCN 40097		7. Org. Code 2T112	
									Customer/Project Code			
8. Customer ID No.	9. Laboratory Sample No.	10. Volume of Sample	11. Matrix of Sample	12. Requested Analyses				13. Expected Range				
183KWBMF		250ml	slurry	Per moy for K-Basin Sandfilter Backwash Pit Samples								

14. Does sample have a MSDS?

- Yes. HEHF assigned MSDS No. _____
 No. Description of process that produced waste/sample:
Process Sample

15. Is this sample RCRA listed? Yes No

Applicable Listed Waste Codes:

Applicable Characteristic Codes:

- Yes No P Codes: (list) _____
 Yes No U Codes: (list) _____
 Yes No K Codes: (list) _____
 Yes No F Codes: (list) _____

- Yes No D001: (how determined) _____ Ignitable
 Yes No D002: (how determined) _____ Corrosive
 Yes No D003: (how determined) _____ Reactive
 Yes No Toxic: (list codes) _____

PCB: Does this waste/sample contain PCBs?

- Yes Over 500 ppm
 Yes Over 50 ppm
 Yes PCBs are suspected
 No PCBs are suspected
- If YES, what is the source of the PCBs?
 Transformer, capacitor, or ballast
 Other, specify _____
 Unknown

16. Sample Disposition

- Return to Customer
 Samples found to contain PCBs will be returned to the customer
 Dispose of per facility procedures with applied charges for analyses and disposal

Sample(s) Date Rate at Contact: 10.5 min / day

HFT Signature: *[Signature]*

17. QC Required

Per 222-S Laboratory Quality Assurance Plan (HNH-SD-CP-QAPP-016)

Other (list reference document or attach) Per K-Basin's MOU

18. Special Instructions (Special Storage Requirements, Reporting format, holding times, etc.)

Attn: Todd Steele and Fran Steen

19. Request of Turnaround Time

- 2 Weeks 4 Weeks
 Other 30 Days

20. Sample Received By:

[Signature]

8-28-98 13:50
Date Time

21. Chain of Custody

- No Yes

Number: 682878 KW

DISTRIBUTION SHEET

To Distribution	From Production Planning & Control	Page 1 of 1	
		Date: 09/25/98	
Project Title/Work Order HNF-1646 Rev. 0, "K Basin Sandfilter Backwash Line Characterization Project Analytical Results for Campaign 15		EDT No.: EDT-623168	
		ECN No.: N/A	
Name	MSIN	Text with All Attach	EDT/ECN ONLY

DE&S Hanford

M. A. Green	X3-56	X	X
J. E. Meacham	S7-14		X

Lockheed Martin Hanford Corp.

J. Jo	R2-12		X
A. E. Young	R1-10		X

Waste Management Federal Services of Hanford, Inc.

E. S. Aromi	H6-30		X
L. A. Diaz	T6-12		X
D. B. Hardy	T6-12		X
J. E. Hyatt	T6-14		X
J. O. Perkins	H6-30		X
T. J. Plush	H6-10		X
K. L. Powell	S3-30		X
D. L. Renberger	T3-03		X
C. M. Seidel	S3-30		X
F. H. Steen	T6-12		X
R. T. Wilde	H6-10		X
<i>Prof Files</i>	X3-85	X	