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			ECN NO.: N/A	
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			ECN NO.: N/A		
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Document Title: 45-Day Safety Screen Results for Tank 241-B-112,
Auger Samples 95-AUG-014 and 95-AUG-015

Release Date: May 1, 1995

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Kara M. Broz

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WHC-SD-WM-DP-105, REV. 0

ANALYTICAL SERVICES

45-DAY SAFETY SCREEN RESULTS FOR TANK 241-B-112,
AUGER SAMPLES, 95-AUG-014 AND 95-AUG-015

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Date Printed:

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This Document consists of pages 1 through 34.

WHC-SD-WM-DP-105, REV. 0

NARRATIVE

45-DAY SAFETY SCREEN RESULTS FOR TANK 241-B-112,
AUGER SAMPLES 95-AUG-014 AND 95-AUG-015

ANALYTICAL SUMMARY

Two auger samples from tank 241-B-112 (B-112) were received in the 222-S Laboratories and underwent safety screening analyses, consisting of differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), and total alpha activity. All results for all analyses (DSC, TGA, and total alpha) were within the safety screening notification limits specified in the Tank Characterization Plan (TCP). No notifications nor secondary analyses were required.

SCOPE

This document serves as the 45-day report deliverable for the tank B-112 auger samples collected on March 16, 1995 (95-AUG-014 and 95-AUG-015). The 222-S Laboratories received, extruded, and analyzed each sample in accordance with the TCP referenced below. Included in this report are the primary safety screening results obtained from the analyses and copies of all DSC and TGA raw data scans as requested per the TCP. Photographs of the auger samples were taken during extrusion and, although not included in this report, are available.

SAMPLE RECEIPT, EXTRUSION, AND SUBSAMPLING

Auger 95-AUG-014

Auger sample 95-AUG-014 was collected from riser 7 of tank B-112 using a 10 inch auger bit. It was received into the 222-S Laboratories on March 17, 1995 at 1145 and extruded on March 27, 1995. A small amount of drainable liquid dripped off the auger (less than 5 mL), but no liquid was recovered for analysis. A gray substance was noticed on flutes 2 and 3 at the top of the auger. These moist solids were subsampled as a possible crust sample (2.02 g recovered in vial# 6499). Wet brown solids were subsampled from flutes 4 through 8 (5.70 g subsampled into vial #6633). A total of 7.72 g of material was recovered from this sample. All analyses required per the TCP were conducted. No archive sample was retained since so little material was collected.

Auger 95-AUG-015

Auger sample 95-AUG-015 was collected from riser 3 of tank B-112 using a 10 inch auger bit. It was received into the 222-S Laboratories on March 17, 1995 at 1145 and extruded on March 28, 1995. There was no drainable liquid, and only 2.70 g of material was recovered. This material (brown solids) was scraped from flutes 3 through 8 of the auger and subsampled into vial #6653. All analyses required per the TCP were conducted. No archive sample was retained since so little material was collected.

SAMPLE IDENTIFICATION INFORMATION

Table 1: Sample Identification

LABCORE Sample ID	Customer Sample ID	Analyses
S96T000356	95-AUG-014, Riser 7, auger sample	Extrusion
S95T000357	95-AUG-014, Riser 7, upper half (crust) subsample	DSC/TGA
S95T000864	95-AUG-014, Riser 7, upper half (crust) subsample fusion/digest	Total alpha
S95T000452	95-AUG-014, Riser 7, remaining solids subsample	DSC/TGA
S95T000481	95-AUG-014, Riser 7, remaining solids fusion/digest	Total alpha
S95T000453	95-AUG-015, Riser 3, auger sample	Extrusion
S95T000454	95-AUG-015, Riser 3, subsample	DSC/TGA
S95T000865	95-AUG-015, Riser 3, fusion/digest	Total alpha

ANALYTICAL RESULTS

Analytical results are presented in Tables 2 and 3, with the applicable notification limits shaded.

DSC (Energetics Content)

DSC analyses were performed under a nitrogen atmosphere using procedure LA-514-113, Rev. B-1. For samples exhibiting exotherms, dry weight basis results were calculated from the wet weight basis results by using the average percent water by TGA for each sample. Both the wet and dry results are given in Tables 2 and 3.

Sample S95T000357 exhibited a small exotherm (in both sample and duplicate). The average value for the exotherm was 13.80 J/g with a relative percent difference (RPD) of 117%, which failed the precision criterion stated in the TCP. The large RPD is due to the presence of an exotherm near the detection limit and lack of homogenization (as explained below for TGA). The average exotherm is less than 3% of the limit of 481 J/g. A third sample was analyzed for S95T000357, resulting in an exotherm of 18.7 J/g. This result does not appear in Table 2, but is provided in the raw data. No other sample exhibited an exotherm.

TGA (Moisture Content)

Weight percent water was performed under a nitrogen atmosphere using procedure LA-560-112, Rev. A-2. Results for samples S95T000357, S95T000452, and S95T000454 and their duplicates ranged in value from 21% to 47% percent water by weight. These results are all above the safety screening action limit of 17% by weight.

The RPD for sample S95T000357 was 62.4% (results were 40.19 and 21.08). This disparity is most likely due to the fact that the sample was not homogenized. Due to the very small amount of sample available, the material was subsampled directly from the auger into a 20 mL vial without homogenization, which would have resulted in unacceptable sample loss.

A third sample was analyzed for sample S95T000357, yielding a result of 32.75% water by weight. A third sample was also analyzed for S95T000452, yielding a result of 46.96% water by weight. These results do not appear in Table 2, but are provided in the raw data.

Total Alpha Activity

Analyses for total alpha activity were performed on samples S95T000481, S95T000864, and S95T000865. Samples were prepared by fusion using procedure LA-549-141, Rev. C-2, and analyses were performed using procedure LA-508-101, Rev. D-2. A sample duplicate was performed on each sample and a spike was performed on sample S95T000481.

The spike recovery was 71.6%, but no rerun was deemed necessary since the samples were near detection limits and far below the safety screening action limit of 41 uCi/g.

REFERENCE

Schreiber, R. D. 1995, WHC-SD-WM-TP-302, Rev. 0, "Tank 241-B-112 Tank Characterization Plan," dated February 6, 1995.

WHC-SD-WM-DP-105, REV. 0

SAMPLE DATA SUMMARY

A-0002-1

26-apr-1995 13:01:10

45 Day Safety Screen Results for B-112
B-112RISER: 7
SEGMENT #: 95-AUG-014

TABLE 2

SEGMENT PORTION: U Upper Half of Segment

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T000357			% Water by TGA using Mettler	%	99.61	n/a	40.19	21.08	30.63	62.4	n/a	n/a	n/a
S95T000357			DSC Exotherm Dry Calculated	Joules/g Dry	n/a	n/a	31.9	8.3	20.10	117	n/a	n/a	n/a
S95T000357			DSC Exotherm using Mettler	Joules/g	110.4	n/a	21.9	5.7	13.80	117	n/a	n/a	n/a
S95T000864	F		Alpha of Digested Solid	uCi/g	98.65	<6.54e-04	<1.07e-3	<5.04e-4	n/a	n/a	n/a	1.00e-03	226.3

SEGMENT PORTION: L Lower Half of Segment

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T000452			% Water by TGA using Mettler	%	99.61	n/a	40.04	43.26	41.65	7.73	n/a	n/a	n/a
S95T000452			DSC Exotherm Dry Calculated	Joules/g Dry	n/a	n/a	0	0	0.000	n/a	n/a	n/a	n/a
S95T000452			DSC Exotherm using Mettler	Joules/g	110.4	n/a	0	0	0.000	n/a	n/a	n/a	n/a
S95T000481	F		Alpha of Digested Solid	uCi/g	98.65	<3.16e-03	1.09e-2	1.04e-2	1.06e-02	4.69	71.60	7.00e-03	56.9

WHC-SD-WM-DP-105, REV. 0

26-apr-1995 13:01:02
A-0002-1

45 Day Safety Screen Results for B-112
B-112

TABLE 3

RISER: 3

SEGMENT #: 95-AUG-015

SEGMENT PORTION: W Whole Segment

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T000454			% Water by TGA using Mettler	%	99.61	n/a	45.57	47.14	46.36	3.39	n/a	n/a	n/a
S95T000454			DSC Exotherm Dry Calculated	Joules/g Dry	n/a	n/a	0	0	0.000	n/a	n/a	n/a	n/a
S95T000454			DSC Exotherm using Mettler	Joules/g	99.12	n/a	0	0	0.000	n/a	n/a	n/a	n/a
S95T000865	F		Alpha of Digested Solid	uCi/g	98.65	<6.54e-04	2.43e-3	2.53e-3	2.48e-03	4.03	n/a	2.00e-03	50.3

WMC-SD-WM-DP-105, REV.0

WHC-SD-WM-DP-105, REV. 0

UNDIGESTED SAMPLE ANALYSES - DIRECT

LABCORE Data Entry Template for Worklist# 922

Analyst: SM Instrument: DSC01 Book # 12N14-1A

Method: LA-514-113 Rev/Mod B-1

Worklist Comment: Please run B-112 DSC under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-01	SOLID	<u>28.45</u>	<u>28.2</u>	<u>N/A</u>	Joules/g
95000036	B-112	2 SAMPLE	S95T000454	0	DSC-01	SOLID	<u>N/A</u>	<u>Ø</u>		Joules/g
95000036	B-112	3 DUP	S95T000454	0	DSC-01	SOLID	<u>Ø</u>	<u>Ø</u>	<u>N/A</u>	Joules/g

Final page for worklist # 922

Lusie M. Dalton
Analyst Signature Date

NE Wright 4/21/95
Analyst Signature Date

Verified by Blandina Valenzuela 4/24/95

Data Entry Comments:

Sample S95T000454 produced two endotherms one at 121.3°C
with a delta H of 1117.6 J/g and the second at 211.0°C with a delta H of 4.5 J/g

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 10 TO 12.

DSC STD 12N14-A

6.340 mg

Rate: 10.0 °C/min

File: 00206.001

DSC METTLER

19-Apr-95

Ident: 0.0

222-S Laboratory

exo >

10. mW

Integration

Delta H 179 mJ

28.2 J/g

Peak 158.6 °C

-12.0 mW

120.

140.

160.

180.

°C

Lucie M. Fulton 4-19-95

WHC-SD-WM-DP-105, REV.0

S95T000454 N2
20.059 mg

Rate: 10.0 °C/min

File: 00210.001 DSC METTLER 20-Apr-95
Ident: 0.0 222-S Laboratory

S95T000454 (DUP) N2

22.985 mg

Rate: 10.0 °C/min

File: 00212.001 DSC METTLER 20-Apr-95
Ident: 0.0 222-S Laboratory

LABCORE Data Entry Template for Worklist# 921

Analyst: DWS Instrument: DSC01 Book # 12N14-A

Method: LA-514-113 Rev/Mod B-1

Worklist Comment: Please run B-112 DSC under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-01	SOLID	<u>28.45</u>	<u>31.0</u>	<u>N/A</u>	Joules/g
95000032	B-112	2 SAMPLE	S95T000357	0	DSC-01	SOLID	<u>N/A</u>	<u>21.9</u>		Joules/g
95000032	B-112	3 DUP	S95T000357	0	DSC-01	SOLID	<u>21.9</u>	<u>5.7</u>	<u>N/A</u>	Joules/g
		4 STD			DSC-01	SOLID	<u>28.45</u>	<u>31.4</u>	<u>N/A</u>	Joules/g
95000032	B-112	5 DUP2	S95T000357	0	DSC-01	SOLID	<u>21.9</u>	<u>18.7</u>	<u>N/A</u>	Joules/g
95000032	B-112	6 SAMPLE	S95T000452	0	DSC-01	SOLID	<u>N/A</u>	<u>Ø</u>		Joules/g
95000032	B-112	7 DUP	S95T000452	0	DSC-01	SOLID	<u>Ø</u>	<u>Ø</u>	<u>N/A</u>	Joules/g

Final page for worklist # 921

See attached for signatures
Analyst Signature Date

Data entered and verified by
Blandina Valenzuela 4/25/95
Analyst Signature Date

Data Entry Comments: S95T000357 produced two endotherms one at 115.3°C with a delta H of 883.0 J/g, and the second at 258.1°C with a delta H of 96.9 J/g. The Std and DUP2 for S95T000357 was performed later, once the chemist was able to look at the results.
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. S95T000452 produced ~~a~~ an endotherm of 947.4 J/g ~~with~~ at 115.3°C
4/25/95 BDV

LABCORE Data Entry Template for Worklist# 921

Analyst: MS Instrument: DSC01 Book # 12014-A

Method: LA-514-113 Rev/Mod B-1

Worklist Comment: Please run B-112 DSC under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-01	SOLID	<u>28.45</u>	<u>31.0</u>	<u>N/A</u>	Joules/g
95000032	B-112	2 SAMPLE	S95T000357	0	DSC-01	SOLID	<u>N/A</u>	<u>21.9</u>		Joules/g
95000032	B-112	3 DUP	S95T000357	0	DSC-01	SOLID	<u>21.9</u>		<u>N/A</u>	Joules/g
95000032	B-112	4 SAMPLE	S95T000452	0	DSC-01	SOLID	<u>N/A</u>	<u>Ø</u>		Joules/g
95000032	B-112	5 DUP	S95T000452	0	DSC-01	SOLID	<u>Ø</u>	<u>Ø</u>	<u>N/A</u>	Joules/g

Final page for worklist # 921

David W Smith 4-18-95
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.

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 15 TO 20.

DSC STD 12N14-A

6.340 mg

Rate: 10.0 °C/min

File: 00195.001

Ident: 0.0

DSC METTLER

19-Apr-95

222-S Laboratory

exo

David W. Smith

4-18-95

S95T000357 N2
 28.180 mg
 Rate: 10.0 °C/min
 File: 00198.001 DSC METTLER 19-Apr-95
 Ident: 0.0 222-S Laboratory

S95T000357 (DUP2) N2
24.827 mg
Rate: 10.0 °C/min
File: 00034.001 DSC METTLER 24-Apr-95
Ident: 0.0 222-S Laboratory

File: 00204.001 DSC METTLER 19-Apr-95
 Ident: 0.0 222-S Laboratory

S95T000452 (DUP) N2
 33.380 mg Rate: 10.0 °C/min

Integration
 Delta H31718 mJ
 950.2 J/g
 Peak 115.3°C
 -80.5 mW

LABCORE Data Entry Template for Worklist# 929

Analyst: DWS Instrument: TGA01 Book # 42N84

Method: LA-560-112 Rev/Mod A-2

Worklist Comment: Please run B-112 TGA under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-01	SOLID	<u>59.19</u>	<u>57.62</u>	N/A	%
95000032	B-112	2 SAMPLE	S95T000357	0	TGA-01	SOLID	<u>N/A</u>	<u>40.19</u>		%
95000032	B-112	3 DUP	S95T000357	0	TGA-01	SOLID	<u>40.19</u>	<u>21.08</u>	N/A	%
95000032	B-112	4 SAMPLE	S95T000452	0	TGA-01	SOLID	<u>N/A</u>	<u>40.04</u>		%
95000032	B-112	5 DUP	S95T000452	0	TGA-01	SOLID	<u>40.04</u>	<u>43.26</u>	N/A	%
		6 STD			TGA-01	SOLID	<u>59.19</u> 42.9	<u>58.96</u>	N/A	%
95000032	B-112	7 DUP2	S95T000357	0	TGA-01	SOLID	<u>40.19</u>	<u>32.75</u>	N/A	%
95000032	B-112	8 DUP2	S95T000452	0	TGA-01	SOLID	<u>40.04</u>	<u>46.96</u>	N/A	%

Final page for worklist # 929

See attached for signatures
Analyst Signature _____ Date _____

[Signature] 4-25-95
Analyst Signature _____ Date _____

Verified by Blainina Valenzuela 4/25/95

Data Entry Comments: The DUP2 for samples S95T000357 and S95T000452 were
run ^{4/24/95} on the day after the ^{other 4/24/95 8:00} samples. Once the chemist was able to
look at the results.

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# 929

Analyst: aws Instrument: TGA01 Book # 42WB-A

Method: LA-560-112 Rev/Mod A-2

Worklist Comment: Please run B-112 TGA under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD				TGA-01	SOLID	<u>59.19</u>	<u>57.62</u>	N/A	%
95000032	B-112	2 SAMPLE	S95T000357	0		TGA-01	SOLID	N/A	<u>40.19</u>		%
95000032	B-112	3 DUP	S95T000357	0		TGA-01	SOLID	<u>39.70</u>	<u>21.08</u>	N/A	%
95000032	B-112	4 SAMPLE	S95T000452	0		TGA-01	SOLID	N/A	<u>40.04</u>		%
95000032	B-112	5 DUP	S95T000452	0		TGA-01	SOLID	<u>40.04</u>	<u>43.26</u>	N/A	%

Final page for worklist # 929

[Signature] 4-18-95
Analyst Signature Date

[Signature] 4-18-95
Analyst Signature Date

Data Entry Comments:

S95T000357 has a second weight loss step of 3.41% at 268°C, duplicate
has 4.49% at 270°C. The sample must be non-homogeneous

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 23 TO 30.

TGA STD 42N8-A

18.076 mg

Rate: 10.0 °C/min

File: 00197.001

Ident: 0.0

TG

METTLER

18-Apr-95

222-S Laboratory

Step Analysis
Height-10.42 mg
-57.62 %
ResidC. 7.66 mg
42.38 %
Dpeak 89.2 °C

S95T000357 N2

29.176 mg

Rate: 10.0 °C/min

File: 00199.001

TG

METTLER

18-Apr-95

Ident: 0.0

222-S Laboratory

Step Analysis

Height-11.72 mg

-40.19 %

ResiC. 17.45 mg

59.81 %

Dpeak 115.0 °C

Step Analysis

Height -1.00 mg

-3.41 %

ResiC. 16.44 mg

56.33 %

Dpeak 269.0 °C

24

5. mg

100.

200.

300.

400.

°C

S95T000357 (DUP) N2

37.286 mg

Rate: 10.0 °C/min

File: 00201.001

TG

METTLER

18-Apr-95

Ident: 0.0

222-S Laboratory

Step Analysis

Height -7.86 mg

-21.08 %

ResiC. 29.43 mg

78.92 %

Dpeak 97.0 °C

Step Analysis

Height -1.67 mg

-4.49 %

ResiC. 27.75 mg

74.43 %

25

5. mg

WHC-SD-WM-DP-105, REV. 0

100.

200.

300.

400.

°C

(DUP2) 4 ~~pages~~ ^{pages}

S95T000357 N2

13.018 mg

File: 00214.001 TG METTLER 19-Apr-95

Ident: 0.0 222-S Laboratory

Rate: 10.0 °C/min

Step Analysis

Height -4.26 mg

-32.75 %

Resid. 8.75 mg

67.25 %

2. mg

Step Analysis

Height -1.07 mg

-8.20 %

Resid. 7.69 mg

59.04 %

S95T000452 N2

33.221 mg

Rate: 10.0 °C/min

File: 00203.001

TG

METTLER

18-Apr-95

Ident: 0.0

222-S Laboratory

Step Analysis

Height-13.30 mg

-40.04 %

ResiC. 19.92 mg

59.96 %

Dpeak 133.0 °C

S95T000452 (DUP) N2

36.008 mg

Rate: 10.0 °C/min

File: 00205.001

TG

METTLER

18-Apr-95

Ident: 0.0

222-S Laboratory

TGA STD 42N8-A
15.915 mg

Rate: 10.0 °C/min

File: 00207.001

Ident: 0.0

TG METTLER

19-Apr-95

222-S Laboratory

Step Analysis
Height -9.38 mg
-58.96 %
Resid. 6.53 mg
41.04 %
Dpeak 78.3°C

50.

100.

150.

Surie M. 200 Dalton 4/19/95

File: 00209.001 TG METTLER 19-Apr-95
 Ident: 0.0 222-S Laboratory

S95T000452 (DUP2) N2
 17.737 mg Rate: 10.0 °C/min

Step Analysis
 Height -8.33 mg
 -46.96 %
 Resid. 9.41 mg
 53.04 %
 Dpeak 103.0 °C

LABCORE Data Entry Template for Worklist# 930

Analyst: MF Instrument: TGA01 Book # 42N8-A

Method: LA-560-112 Rev/Mod A-2

Worklist Comment: Please run B-112 TGA under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-01	SOLID	<u>59.19</u>	<u>58.96</u>	<u>N/A</u>	%
95000036	B-112	2 SAMPLE	S95T000454	0	TGA-01	SOLID	<u>N/A</u>	<u>45.57</u>		%
95000036	B-112	3 DUP	S95T000454	0	TGA-01	SOLID	<u>45.57</u>	<u>47.14</u>	<u>N/A</u>	%

Final page for worklist # 930

Susie M. Sutton 4-19-95
Analyst Signature Date

NEW Light 4/21/95
Analyst Signature Date

Verified by Blandina Valenzuela

Data Entry Comments:

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 32 TO 34.

TGA STD 42N8-A

15.915 mg

Rate: 10.0 °C/min

File: 00207.001 TG METTLER 19-Apr-95

Ident: 0.0 222-S Laboratory

Step Analysis
Height -9.38 mg
-58.96 %
ResidC. 6.53 mg
41.04 %
Dpeak 78.3 °C

150. *Laurie M. Dutton* 200 4-19-95 °C

File: 00213.001 TG METTLER 19-Apr-95
 Ident: 0.0 222-S Laboratory

S95T000454 (DUP) N2
 15.688 mg Rate: 10.0 °C/min

Step Analysis
 Height -7.40 mg
 -47.14 %
 ResiC. 8.29 mg
 52.86 %
 Dpeak 121.0 °C