SOUTHWEST RESEARCH INSTITUTE®

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CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY

January 18, 2016

CH2M Hill Plateau Remediation Company
2420 Stevens Center Place
Mail Stop H8-41
Richland, WA 99352

Attn: David Todak

Subject:

SAF No:	F16-003
SDG Number:	588637
SwRI Project Number:	20859.01.00X
SwRI Task Order Number:	151203-2
SwRI Sample Receipt Number:	56649
Samples Received:	12.03.2015
Fraction:	Various

Dear Mr. Todak:

Please find the enclosed results for the two (02) overall samples received on the above referenced date. If you should have any questions, please do not hesitate to call me at (210) 522-3242, radonna.spies@swri.org.

Sincerely,

Radonna Spies
Group Leader

APPROVED:

Michael J. Dammann
Director

RPS: jz
Encl

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 151203-2
SwRI SRR: 56649
SDG: 588637
VTSR: 12.03.2015

CHAIN-OF-CUSTODY
&
SAMPLE RECEIPT PAPERWORK

Total Page Count: 010001
Fraction: Various Pages: 010073

JANUARY 18, 2016

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F16-003-001	PAGE 1 OF 1
COLLECTOR: K. Patterson / CHPRC	COMPANY CONTACT: TODAK, D	TELEPHONE NO.: 376-6427	PROJECT COORDINATOR: TODAK, D	PRICE CODE: ~~9G~~ ~~9H~~	DATA TURNAROUND: ~~30~~ 15 Days / 30 Days
SAMPLING LOCATION: ETGS Solution	PROJECT DESIGNATION: ETGS Fixative From PFP - Other Liquid Sampling		SAF NO.: F16-003	AIR QUALITY: ☐ 11-30-15	
ICE CHEST NO.: GWS-032	FIELD LOGBOOK NO.: HNF-N-507 30	ACTUAL SAMPLE DEPTH: N/A	COA: 303953	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: Southwest Research Institute	OFFSITE PROPERTY NO.: 6179		BILL OF LADING/AIR BILL NO.: 7750 9996 6137		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	None
HOLDING TIME	28 Days
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	125mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

Client: CH2M Hill Plateau Remediation Company SwRI SRR #56649
SwRI Project # 20859.01.00X Case: 303953
VTSR: 12/03/15 08:30 Sample(s) Received: Intact
Battery Check: Y Background Check: <100 cpm (Lab 103)
Cooler/Container Wipe: <0.5 mR/hr Temp.: 4.5°C (wet ice) / SN # 021056
Total cpm-mR/h (samples): <100 cpm; <0.5 mR/hr Wipe Frisk Description: Cooler(s) - 1
(see Radioactive Material Receiving Form for more information)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B33Y75	OTHER LIQUID	12.2.15	0740	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: K. Patterson CHPRC	DATE/TIME: 12.2.15 0805	RECEIVED BY/STORED IN: L.D. Wall CHPRC	DATE/TIME: 12.2.15 0805
RELINQUISHED BY/REMOVED FROM: L.D. Wall CHPRC	DATE/TIME: DEC 0 2 2015 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: FedEx	DATE/TIME: 12/3/15 0830	RECEIVED BY/STORED IN:	DATE/TIME: 12/3/15 0836
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
(1) HPLC - MS {Fluorescent Brightener 220}; ~~HPLC - RI~~ GC-FID {Glycerin}; 11-30-15

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 11/30/2015 FSR ID = FSR10953 TRVL NUM = TRVL-16-033 A-6003-618 (REV 2)

010003

JANUARY 18, 2016

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F16-003-002	PAGE 1 OF 1
COLLECTOR: Kevin Patterson / CHPRC	COMPANY CONTACT: TODAK, D	TELEPHONE NO.: 376-6427	PROJECT COORDINATOR: TODAK, D	PRICE CODE: ~~9H~~ 9G	DATA TURNAROUND: ~~30~~ 15 Days / 30 Days
SAMPLING LOCATION: ETGS Solution (Duplicate)	PROJECT DESIGNATION: ETGS Fixative From PFP - Other Liquid Sampling		SAF NO.: F16-003	AIR QUALITY: ☐ 11-30-15	
ICE CHEST NO.: GWS-032	FIELD LOGBOOK NO.: HNF-N-507 30	ACTUAL SAMPLE DEPTH: N/A	COA: 303953	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: Southwest Research Institute	OFFSITE PROPERTY NO.: 6179		BILL OF LADING/AIR BILL NO.: 7750 9996 6137		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	None
HOLDING TIME	28 Days
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	125mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B33Y76	OTHER LIQUID	12.2.15	0740	✓

Client: CH2M Hill Plateau Remediation Company SwRI SRR #56649
SwRI Project # 20859.01.00X Case: 303953
VTSR: 12/03/15 08:30 Sample(s) Received: Intact
Battery Check: Y Background Check: <100 cpm (Lab 103)
Cooler/Container Wipe: <0.5 mR/hr Temp.: 4.5°C (wet ice) / SN # 021056
Total cpm-mR/h (samples): <100 cpm; <0.5 mR/hr Wipe Frisk Description: Cooler(s) - 1
(see Radioactive Material Receiving Form for more information)

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: K. Patterson CHPRC	DATE/TIME: 12.2.15 0805	RECEIVED BY/STORED IN: L.D. Wall CHPRC	DATE/TIME: 12.2.15/0805
RELINQUISHED BY/REMOVED FROM: L.D. Wall CHPRC	DATE/TIME: DEC 0 2 2015 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: Fed Ex	DATE/TIME: 12/3/15 0830	RECEIVED BY/STORED IN:	DATE/TIME: 12/3/15 0830
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:

SPECIAL INSTRUCTIONS
(1) HPLC - MS {Fluorescent Brightener 220}; ~~HPLC - RI~~ GC-FID {Glycerin};
11-30-15

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 11/30/2015 FSR ID = FSR10954 TRVL NUM = TRVL-16-033 A-6003-618 (REV 2)

JANUARY 18, 2016

Southwest Research Institute

Laboratory Task Order

TO #: 151203-2 Revision: 0

Project(s): 20859.01.00X
Manager(s): SPIES, RADONNA
To Client: 12/17/15

SDG: 588637

SRR #'s: 56649
Client(s): CH2M Hill Plateau Remediation Company

Instructions

Tests

% Level Glycerin by GC/FID

UV Blue by UV or Fluorescence

preliminary glycerin (GC-FID) - 15 day TAT with final report including the fluorescent brightener within 28 days

Documents Related to this task order: 190903[COC for SRR 56649], 190904[SRR Paperwork for SRR 56649]

Deliverables --> Hard Copy: no EDD: no PDF: -YES-

Test: TDG GC-FID
Section: TDG

Holding: 14 days from VTSR

Cnt: 2

System ID	Type	Cont	Matrix	Customer ID	VTSR	Method Date
588637		1	Other	B33Y75	03 Dec 15	17 Dec 15
588638		1	Other	B33Y76	03 Dec 15	17 Dec 15

Test: WET-MISC
Section: WETCHEM

Holding: 60 days from CED

Any miscellaneous wetchem test.

Cnt: 2

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
588637		1	Other	B33Y75	02 Dec 15	31 Jan 16
588638		1	Other	B33Y76	02 Dec 15	31 Jan 16

JANUARY 18, 2016

Sample Receipt

Southwest Research Institute

Sample Receipt Number: 56649
Revision: 1

This Receipt was Revised 12/09/2015

VTSR: 12/03/15

Time: 08:30:00

Project: 20859.01.00X
Case #: 303953
Client: CH2M Hill Plateau Remediation Company

Manager: SPIES, RADONNA
Logged in by: SDOUGLAS
Creation Date: 12/03/15

Notes

Samples were received intact. (wet ice)

Fed Ex Tracking #:
775099966137 - 4.5 °C

Parameters: Analysis/located on Task Order.

See chain-of-custody as part of the SRR system for more information.

Phases:
001 - admin
006 - wetchem

Rev. 1
Corrected notes and temperature.

Background CPM: <100 cpm
Container Wipe CPM: <100 cpm
Total CPM: <100

System ID	Customer ID	CED	Matrix	Containers	Special Reqs.
588637	B33Y75	12/02/15	Other Liquid	1	
588638	B33Y76	12/02/15	Other Liquid	1	

Containers: 2 **Samples: 2**

These documents are associated with this receipt: 190903[COC for SRR 56649], 190904[SRR Paperwork for SRR 56649]

Thermometer: 021056
Temperature: 4.5

56649 CH2M Hill Plateau Remediatio

JANUARY 18, 2016

Southwest Research Institute

Traffic Report

Sample Custodian Signature: _____

1. Custody Seal — Present
2. Chain of Custody — Present
3. Sample Tags — Not Present
   Sample Tag Numbers — Not on COC
4. SMO Forms — Not Present

Client: CH2M Hill Plateau Remediation Company

Project: 20859.01.00X

Case: 303953 / SDG: _____

Sample Receipt: 56649

Airbill: 775099966137

Custody Seal #(s): N/A

Date Received	Time Received	COC Record	SMO Sample #	Corresponding		Traffic Rpt, Tags, COC Agree	Sample Condition
				Sample Tag #	SwRI #		
12/03/15	08:30:00	F16-003-001	B33Y75	N/A	588637	YES	Intact
12/03/15	08:30:00	F16-003-002	B33Y76	N/A	588638	YES	Intact

JANUARY 18, 2016

SAMPLE LOG-IN SHEET

Lab Name: Southwest Research Institute	Page 1 of 1
Received By (Print Name): STEVEN DOUGLAS	Log-in Date: 12/03/2015
Received By (Signature):	
Case Number: 303953	Sample Delivery Group No.: NA
SAS Number: NA	
Remarks: 20859.01.00X	

1.	Custody Seal(s)	Present/Absent* Intact/Broken
2.	Custody Seal Nos.	N/A
3.	Chain-of Custody Records	Present/Absent*
4.	Traffic Reports or Packing Lists	Present/Absent
5.	Airbill	Airbill/Sticker Present/Absent*
6.	Airbill No.	775099966137
7.	Sample Tags	Present/Absent
	Sample Tag Numbers	Listed/Not listed on Chain of Custody
8.	Sample Condition	Intact/Broken*/Leaking
9.	Cooler Temperature	4.5C
10.	Does Information on custody records, traffic reports, and sample tags agree?	Yes/No*
11.	Date Received at Lab	12/03/2015
12.	Time Received	08:30:00

EPA Sample #	Corresponding: Sample Tag #	Corresponding: Assigned Lab #	Remarks: Condition of Sample Shipment, etc
B33Y75	N/A	588637	Intact
B33Y76	N/A	588638	Intact

Sample Transfer	
Fraction: INORG	Fraction
Area #: R.13	Area #
By: STEVEN DOUGLAS	By
On: 12/03/2015	On

* Contact SMO and attach record of resolution

Reviewed By: [signature]	Logbook No.: Sample Receipt (56649)
Date: 12.16.15	Logbook Page No.: 9292 SEC 2 of 4

FORM DC-1

OLMO4.2

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 151203-2
SwRI SRR: 56649
SDG: 588637
VTSR: 12.03.2015

CASE NARRATIVE

CLIENT: CH2M Hill Plateau Remediation Company
SDG: 588637
SwRI Project Number: 20859.01.00X
SwRI Sample Receipt Number: 56649
Page#: 1

SwRI CASE NARRATIVE

1. Two (02) samples were received for Glycerin by GC/FID and Fluorescence:

SwRI ID	Customer ID	Matrix
588637	B33Y75	Other Liquid
588638	B33Y76	Other Liquid

Client: CH2M Hill Plateau Remediation Company
Case #: 303953
SwRI Project Number: 20859.01.00X
SwRI Task Order Number: 151203-2
Sample Receipt Reports (SRR): 56649

Glycerin GC/FID Analysis

Two liquid samples were received on Dec 03, 2015 for glycerin GC/FID analysis under SRR: 56649. Task order was generated for this work under 151203-2.

TAP 01-0408-095 was used for the analysis of glycerin in the two liquid samples. The GC analysis was performed on an Agilent 6890N GC equipped with a flame ionization detector (FID). The system was equipped with Agilent DB-624 30m; 0.25 mm id; 1.40 µm film capillary column. The injector temperature was set at 250 °C with a pulsed split injection of 25:1. The oven program was 80 °C for 0.5 minute then 10 °C/min to 250 °C. Helium flow rate was set at 1.5 mL/min.

External standard calibration was performed on Dec 04, 2015 and five working level standards ranging from ~0.233 to 2.33 mg/mL were used. A first-order linear regression calibration model was used and a R^2 coefficient of determination of 0.995 or higher was achieved.

The two liquid samples were prepared at approximately 7 mg/mL in methanol. Approximately 170-200 mg of the samples were weighed out and diluted to a final volume of 25 mL using methanol. Sample B33Y75 was prepared twice by weighing out two separate aliquots.

Continuing calibration verification (CCV) was analyzed at the end of the sequence and was within QC limit of 75 – 125%. A second analyst prepared a 1 mg/mL glycerin solution and this solution was used for calibration curve verification. The concentration was within QC limit of 75 – 125%.

Sample Calculation:
(Slight differences may be due to rounding or number of significant figures used in the software.)

Sample ID: B33Y76 (SwRI ID: 588638)
GC/FID File ID: W1204502 Sample weight: 192.15 mg Volume: 25.0 mL

Calibration curve for glycerin: $1.7139 \times 10^7 * x - 2.0500 \times 10^6 = y$

Solve for x: $1.7139 \times 10^7 * x - 2.0500 \times 10^6 = 11530532$
$x = 0.7924$

Concentration $x = 0.7924$ mg/mL

Amount of glycerin reported = 0.7924 mg/mL x 25 mL ÷ 192.15 mg = 0.103 = 10.3%

Client: CH2M Hill Plateau Remediation Company
Case #: 303953
SwRI Project Number: 20859.01.00X
SwRI Task Order Number: 151203-2
Sample Receipt Reports (SRR): 56649

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Director or his designee, as verified by the following signature. This report shall not be reproduced except in full, without the written approval of SwRI."

Manager 12/7/15 **Date**

Client: CH2M Hill Plateau Remediation Company
SDG: 588637
SwRI Project Number: 20859.01.00X
SwRI Task Order Number: 151203-2

Fluorescent Brightener 220 (CAS 16470-24-9)

Fluorescent Brightener 220, Technical grade from Santa Cruz Biotechnology (SC-498917). A second source was not located since most fluorescent brighteners are sold in bulk; therefore, an independent control standard was prepared by an analyst other than the one preparing the stock standard solution.

Samples were analyzed by fluorescence. The sample was excited at 350 nm and the emission was measured from 620 nm to 365 nm. The maximum peak height of the emission spectra, at approximately 440 nm, was determined for each standard. The samples were diluted in water and compared to standard calibration curve prepared from the SCB standard.

ICV/CCVs were within 90-110% of the true values. The ICV/CCBs were below the instrument reporting limit. The procedure blank was less than the reporting limit and the laboratory control limits were within 20% of the true value. The sample and sample duplicate were non-detects; therefore, the RPD was 0%. The matrix spike was within 75-125% recovery.

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the laboratory manager or his/her designee, as verified by the following signature. This report shall not be reproduced except in full without the written approval of SwRI."

for R. Spier

Group Leader

01/18/16
Date

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 151203-2
SwRI SRR: 56649
SDG: 588637
VTSR: 12.03.2015

GLYCERIN GC/FID ANALYSIS

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 151203-2
SwRI SRR: 56649
SDG: 588637
VTSR: 12.03.2015

Glycerin GC/FID
QC Summary

JANUARY 18, 2016

Southwest Research Institute

Glycerin GC-FID Analysis
Sample/Sample Duplicate Summary

Project Number:	20859.01.00X	Client Sample ID:	B33Y75
Client:	CH2M Hill Plateau Remediation	System ID:	588637
SDG:	588637	Filenames:	W1204503
Matrix:	Liquid		W1204504
SRR:	56649	Instrument:	Windu
Task Order:	151203-2		

Compound	Sample Conc (%)	Sample Dup Conc (%)	% RPD	QC Limit RPD
Glycerin	10.4%	11.3%	8.7%	25.0%

JANUARY 18, 2016

Southwest Research Institute

Glycerin GC-FID Analysis
Blank Summary

Project Number:	20859.01.00X	Client Sample ID:	MB_04DEC15
Client:	CH2M Hill Plateau Remediation	System ID:	588787
SDG:	588637	Filename:	W1204501
		Date Analyzed:	12/4/2015 17:17

Sample ID	SwRI ID	Filename	Analyzed
B33Y75	588637	W1204503	12/4/2015 18:00
B33Y75 DUP	588637 DUP	W1204504	12/4/2015 18:21
B33Y76	588638	W1204502	12/4/2015 17:39

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 151203-2
SwRI SRR: 56649
SDG: 588637
VTSR: 12.03.2015

Glycerin GC/FID
Sample Results

JANUARY 18, 2016

Southwest Research Institute

Glycerin GC-FID Analysis Data Reporting Form

Project Number:	20859.01.00X	Client Sample ID:	B33Y75
Client:	CH2M Hill Plateau Remediation	System ID:	588637
SDG:	588637	Sample vol (mg):	178.67
Matrix:	Liquid	Extract vol (mL):	25.0
SRR:	56649		
Task Order:	151203-2	Filename:	W1204503
Date Received:	12/3/2015	Instrument:	Windu
Date Extracted:	12/4/2015	Date Analyzed:	12/4/2015 18:00

Cas No.	Compound	Conc (%)
56-81-5	**Glycerin**	**10.4%**

DATA REPORTING QUALIFIERS

B This flag is used when the analyte is found in the blank as well as the sample.
D This flag identifies a compound reported at a secondary dilution factor.
E This flag indicates compounds whose concentrations exceed the calibration range.
J Indicates an estimated value.
U Indicates compound was analyzed for, but not detected.

Quantitation Report (QT Reviewed)

JANUARY 18, 2016

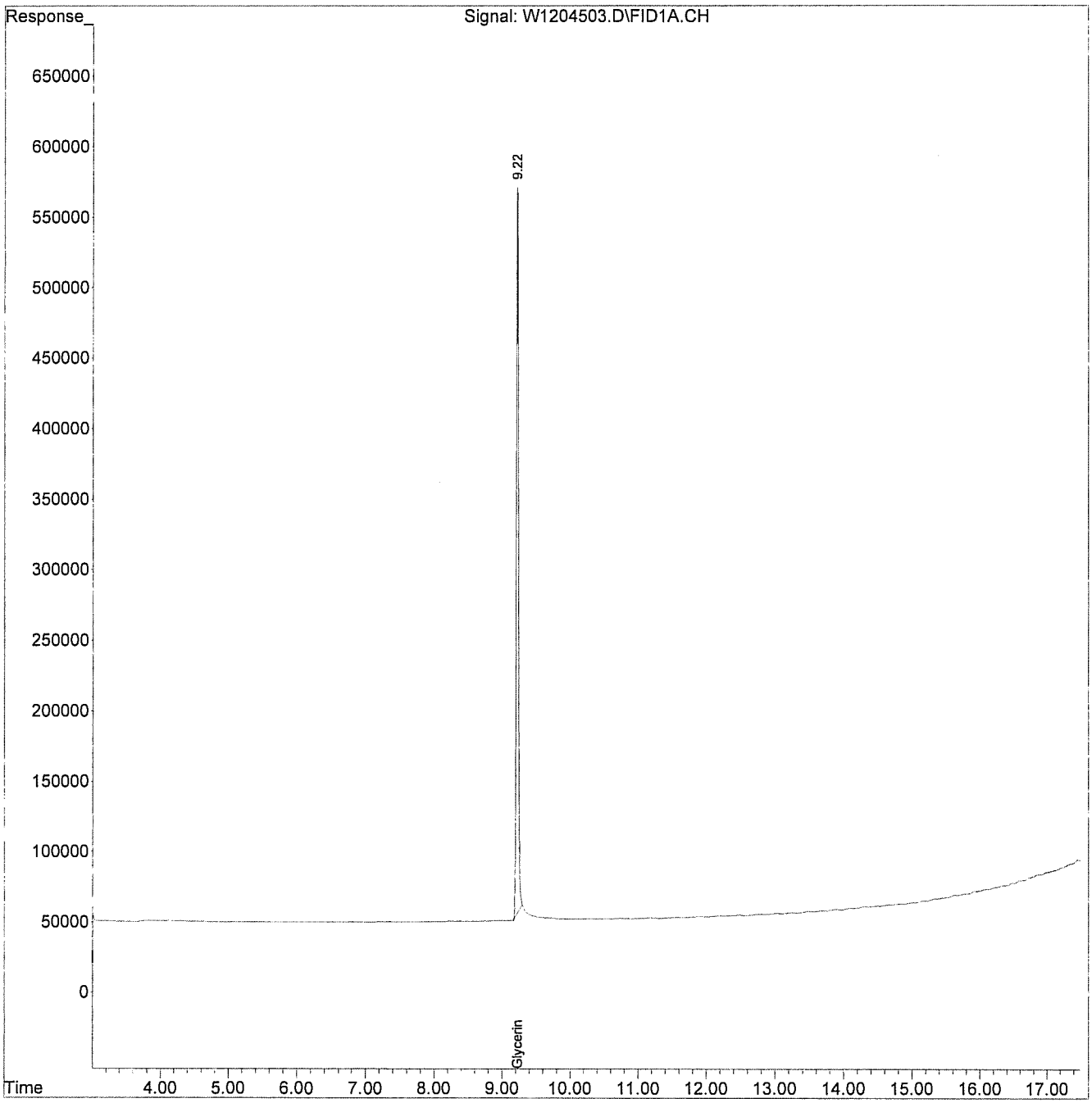
Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W1204503.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 6:00 pm
Operator : AYY
Sample : B33Y75 (SwRI:588637 - 7.1468 mg/mL)
Misc : 20859.01.00X TO: 151203-2
ALS Vial : 9 Sample Multiplier: 1

REVIEWED BY: [signature]
DATE: 12/07/15

Integration File: events.e
Quant Time: Dec 04 18:18:10 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Ayan 12/7/15

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W1204503.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 6:00 pm
Operator : AYY
Sample : B33Y75 (SwRI:588637 - 7.1468 mg/mL)
Misc : 20859.01.00X TO: 151203-2
ALS Vial : 9 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 04 18:18:10 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) Glycerin	9.22	10666323	0.74195 mg/mL

(f)=RT Delta > 1/2 Window (m)=manual int.

JANUARY 18, 2016

Southwest Research Institute

Glycerin GC-FID Analysis Data Reporting Form

Project Number:	20859.01.00X	Client Sample ID:	B33Y75 DUP
Client:	CH2M Hill Plateau Remediation	System ID:	588637 DUP
SDG:	588637	Sample vol (mg):	176.80
Matrix:	Liquid	Extract vol (mL):	25.0
SRR:	56649		
Task Order:	151203-2	Filename:	W1204504
Date Received:	12/3/2015	Instrument:	Windu
Date Extracted:	12/4/2015	Date Analyzed:	12/4/2015 18:21

Cas No.	Compound	Conc (%)
56-81-5	**Glycerin**	**11.3%**

DATA REPORTING QUALIFIERS

B This flag is used when the analyte is found in the blank as well as the sample.
D This flag identifies a compound reported at a secondary dilution factor.
E This flag indicates compounds whose concentrations exceed the calibration range.
J Indicates an estimated value.
U Indicates compound was analyzed for, but not detected.

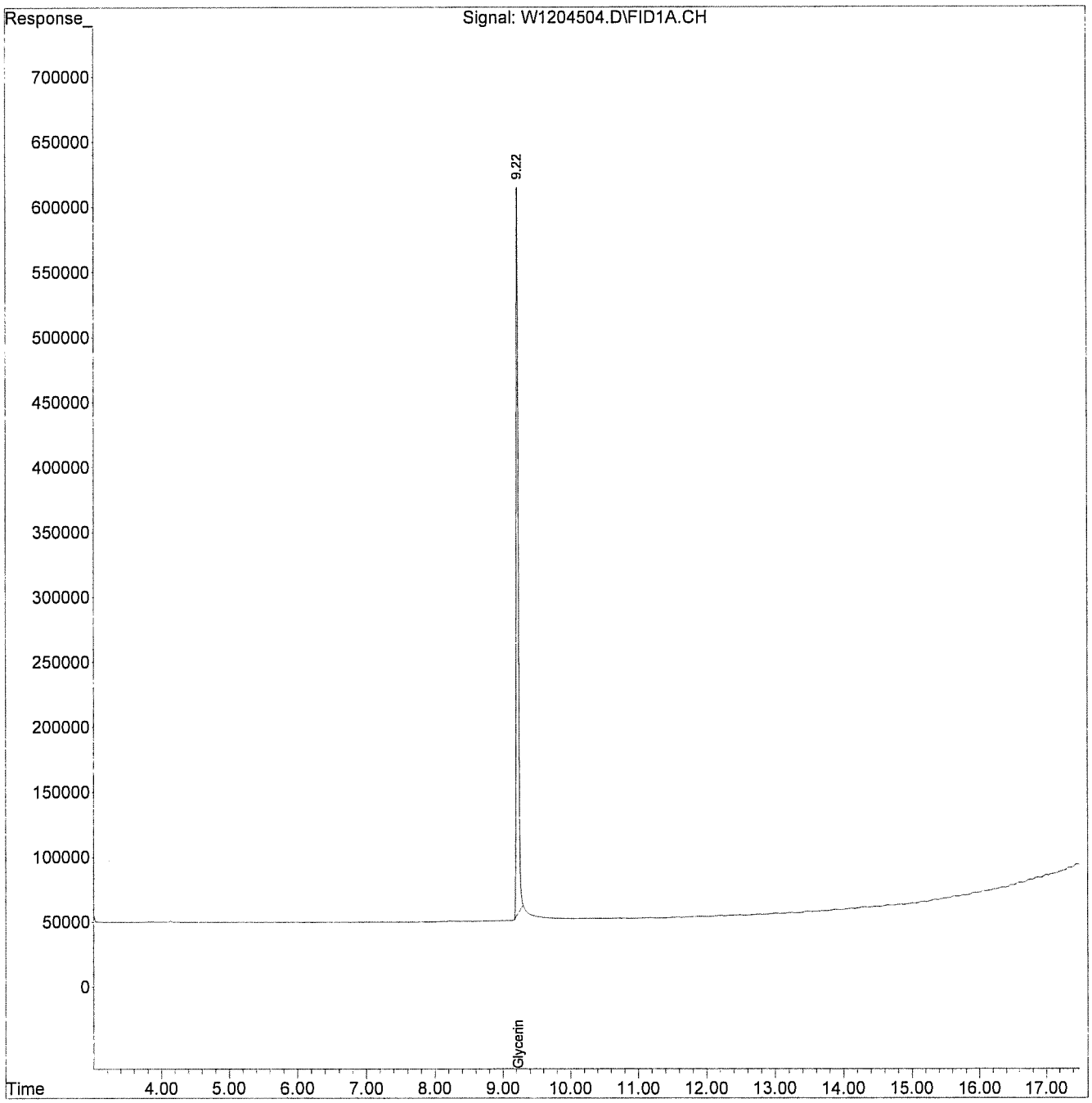
Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W1204504.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 6:21 pm
Operator : AYY
Sample : B33Y75 DUP (SwRI:588637 DUP - 7.072 mg/mL)
Misc : 20859.01.00X TO: 151203-2
ALS Vial : 10 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 07 08:40:14 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W1204504.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 6:21 pm
Operator : AYY
Sample : B33Y75 DUP (SwRI:588637 DUP - 7.072 mg/mL)
Misc : 20859.01.00X TO: 151203-2
ALS Vial : 10 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 07 08:40:14 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) Glycerin	9.22	11679951	0.80109 mg/mL

(f)=RT Delta > 1/2 Window (m)=manual int.

JANUARY 18, 2016

Southwest Research Institute

Glycerin GC-FID Analysis Data Reporting Form

Project Number:	20859.01.00X	Client Sample ID:	B33Y76
Client:	CH2M Hill Plateau Remediation	System ID:	588638
SDG:	588637	Sample vol (mg):	192.15
Matrix:	Liquid	Extract vol (mL):	25.0
SRR:	56649		
Task Order:	151203-2	Filename:	W1204502
Date Received:	12/3/2015	Instrument:	Windu
Date Extracted:	12/4/2015	Date Analyzed:	12/4/2015 17:39

Cas No.	Compound	Conc (%)
56-81-5	**Glycerin**	**10.3%**

DATA REPORTING QUALIFIERS

B This flag is used when the analyte is found in the blank as well as the sample.
D This flag identifies a compound reported at a secondary dilution factor.
E This flag indicates compounds whose concentrations exceed the calibration range.
J Indicates an estimated value.
U Indicates compound was analyzed for, but not detected.

Quantitation Report (QT Reviewed)

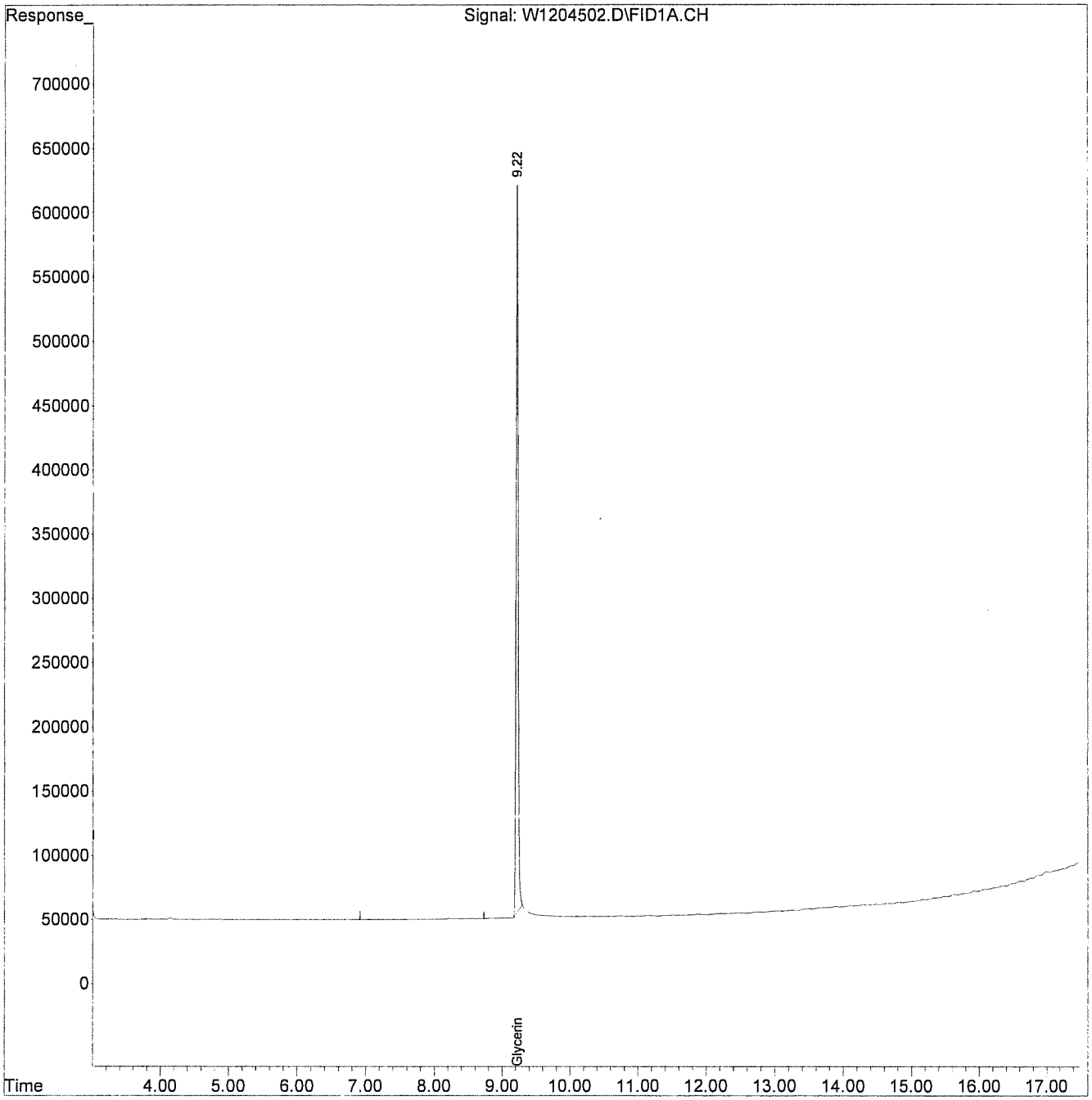
JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W1204502.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 5:39 pm
Operator : AYY
Sample : B33Y76 (SwRI:588638 - 7.686 mg/mL)
Misc : 20859.01.00X TO: 151203-2
ALS Vial : 8 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 04 17:57:22 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Ay 12/4/15



Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W1204502.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 5:39 pm
Operator : AYY
Sample : B33Y76 (SwRI:588638 - 7.686 mg/mL)
Misc : 20859.01.00X TO: 151203-2
ALS Vial : 8 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 04 17:57:22 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) Glycerin	9.22	11530532	0.79237 mg/mL

(f)=RT Delta > 1/2 Window (m)=manual int.

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 151203-2
SwRI SRR: 56649
SDG: 588637
VTSR: 12.03.2015

Glycerin GC/FID
QC Raw Data

JANUARY 18, 2016

Southwest Research Institute

Glycerin GC-FID Analysis Data Reporting Form

Project Number:	20859.01.00X	Client Sample ID:	MB_04DEC15
Client:	CH2M Hill Plateau Remediation	System ID:	588787
SDG:	588637	Sample vol (mg):	190.00
Matrix:	Liquid	Extract vol (mL):	25.0
SRR:	56649		
Task Order:	151203-2	Filename:	W1204501
Date Received:	N/A	Instrument:	Windu
Date Extracted:	12/4/2015	Date Analyzed:	12/4/2015 17:17

Cas No.	Compound	Conc (%)	
56-81-5	Glycerin	3.1%	U

DATA REPORTING QUALIFIERS

B This flag is used when the analyte is found in the blank as well as the sample.
D This flag identifies a compound reported at a secondary dilution factor.
E This flag indicates compounds whose concentrations exceed the calibration range.
J Indicates an estimated value.
U Indicates compound was analyzed for, but not detected.

Quantitation Report (QT Reviewed)

JANUARY 18, 2016

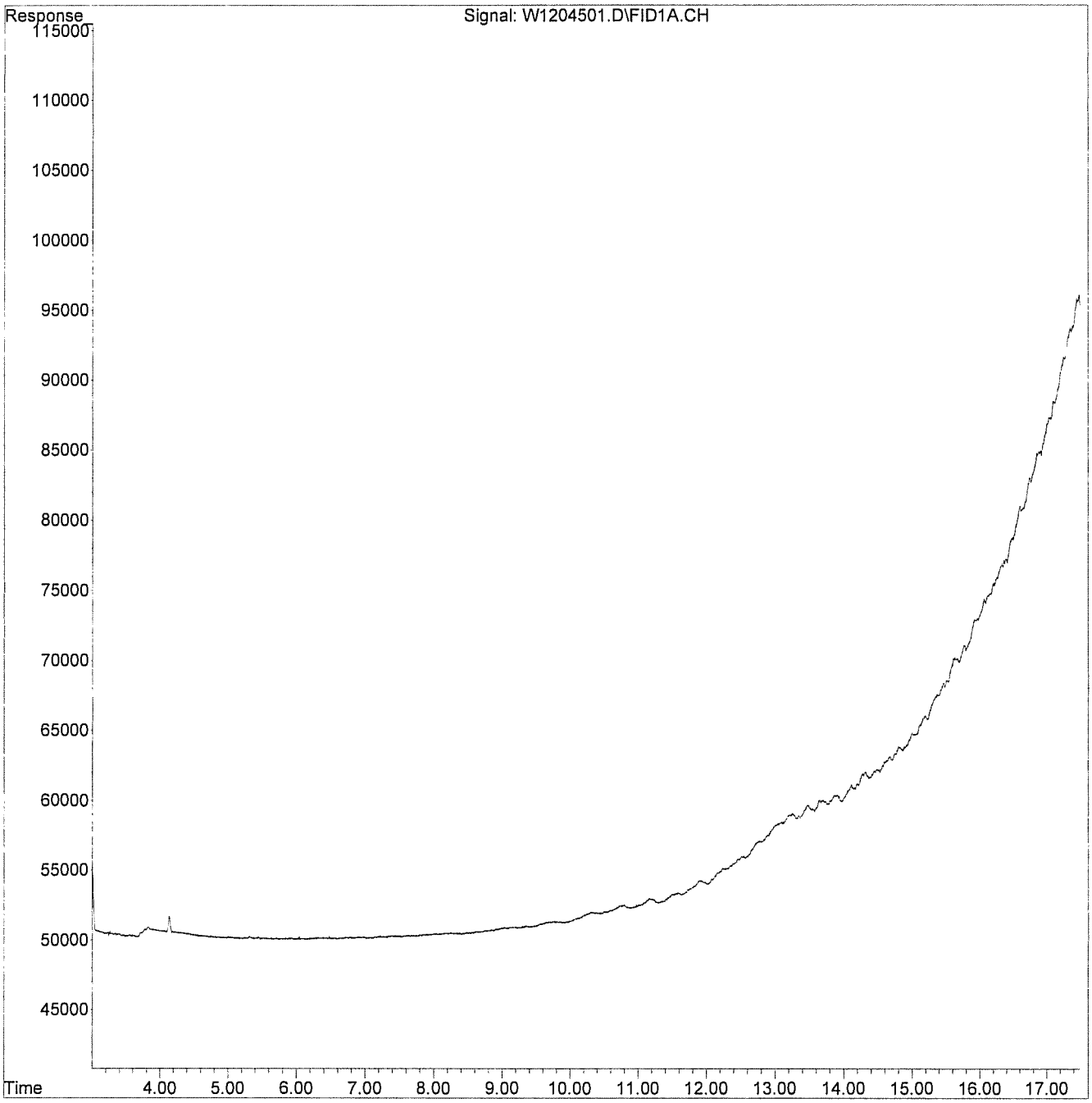
Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W1204501.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 5:17 pm
Operator : AYY
Sample : Methanol blank
Misc : OmniSolv Lot: 53270
ALS Vial : 7 Sample Multiplier: 1

588787-MB_04DEC15

Integration File: events.e
Quant Time: Dec 04 17:47:15 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Ayan 12/7/15

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W1204501.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 5:17 pm
Operator : AYY
Sample : Methanol blank 588787 - MB_04DEC15
Misc : OmniSolv Lot: 53270
ALS Vial : 7 Sample Multiplier: 1

Ayan 12/7/15

Integration File: events.e
Quant Time: Dec 04 17:47:15 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Glycerin	0.00	0	N.D.	mg/mL

(f)=RT Delta > 1/2 Window (m)=manual int.

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 151203-2
SwRI SRR: 56649
SDG: 588637
VTSR: 12.03.2015

Glycerin GC/FID Standard Data

JANUARY 18, 2016

Southwest Research Institute

Glycerin Initial Calibration Data Sheet

Project Number: 20859.01.00X SDG: 588637
Client: CH2M Hill Plateau Remediation Calibration Date: 12/04/15

Compound: Glycerin		Theoretical	Calculated	Acceptable Range		
File ID	SwRI Standard ID	Conc (mg/mL)	Conc (mg/mL)	75% - 125%		
W12045S1	566-Std5-Lab202_2015	2.331	2.3522	1.75	2.91	
W12045S2	566-Std4-Lab202_2015	1.1655	1.0407	0.87	1.46	
W12045S3	566-Std3-Lab202_2015	0.6993	0.7680	0.52	0.87	
W12045S4	566-Std2-Lab202_2015	0.4662	0.5133	0.35	0.58	
W12045S5	566-Std1-Lab202_2015	0.2331	0.2507	0.15	0.31	*

* The acceptable range for the lowest level standard is 65% - 135%.

Calibration Report Windu

JANUARY 18, 2016

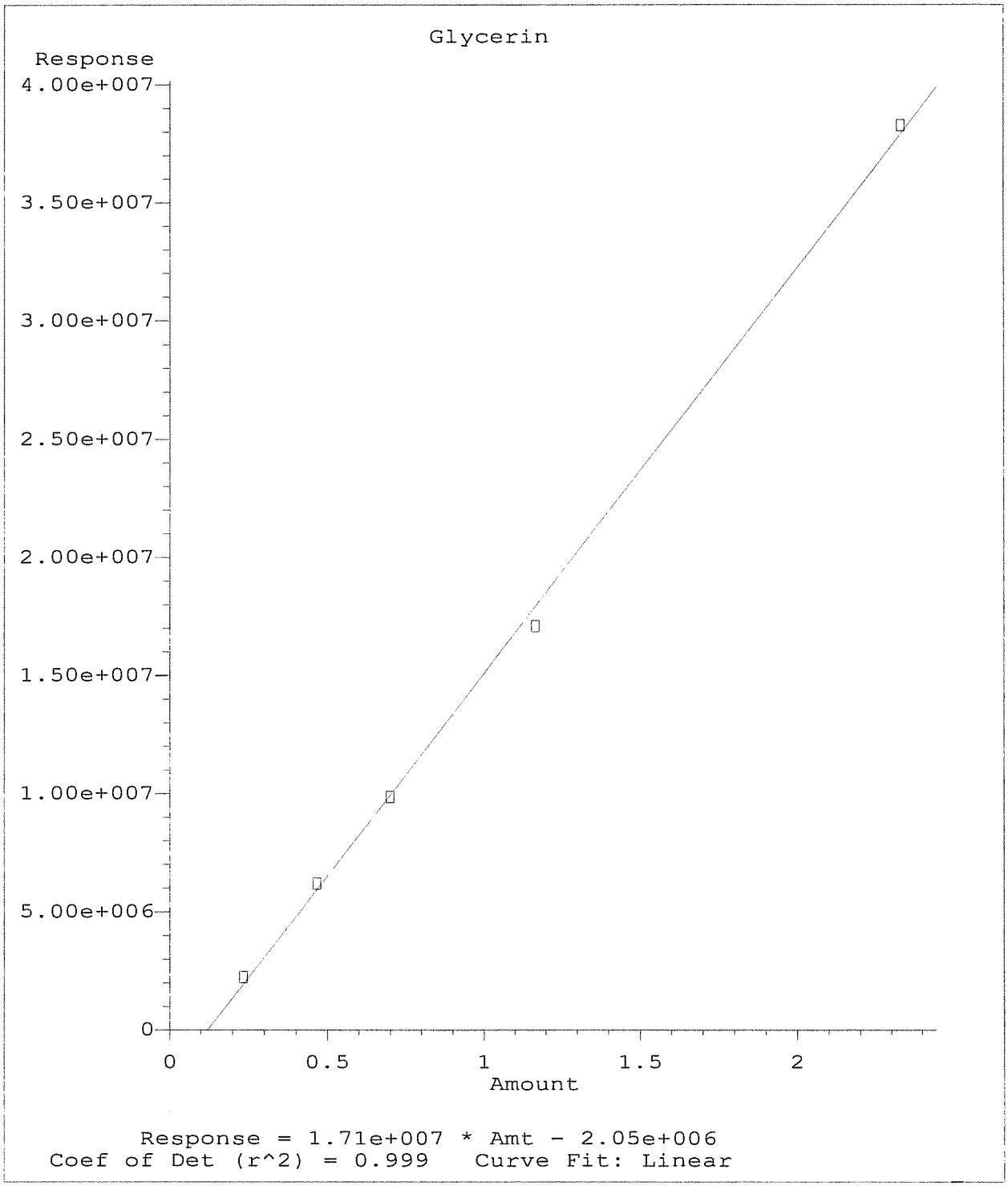
Method Path : C:\MSDCHEM\2\METHODS\
Method File : GLYCEROL.M
Title : Glycerin GC/FID analysis
Last Update : Fri Dec 04 16:53:20 2015
Response Via : Initial Calibration

Calibration Files
5 =W12045S1 4 =W12045S2 3 =W12045S3 2 =W12045S4 1 =W12045S5

	Compound	Fit	Constant	Linear	Quad	RSD/Cf
1)	Glycerin	Lin	-2.0500 e6	1.7139 e7	-----	0.9988

GLYCEROL.M Fri Dec 04 17:46:14 2015

Ay 12/4/15



Method Name: C:\MSDCHEM\2\METHODS\GLYCEROL.M
Calibration Table Last Updated: Fri Dec 04 16:53:20 2015

Ay 12/4/15

Quantitation Report (QT Reviewed)

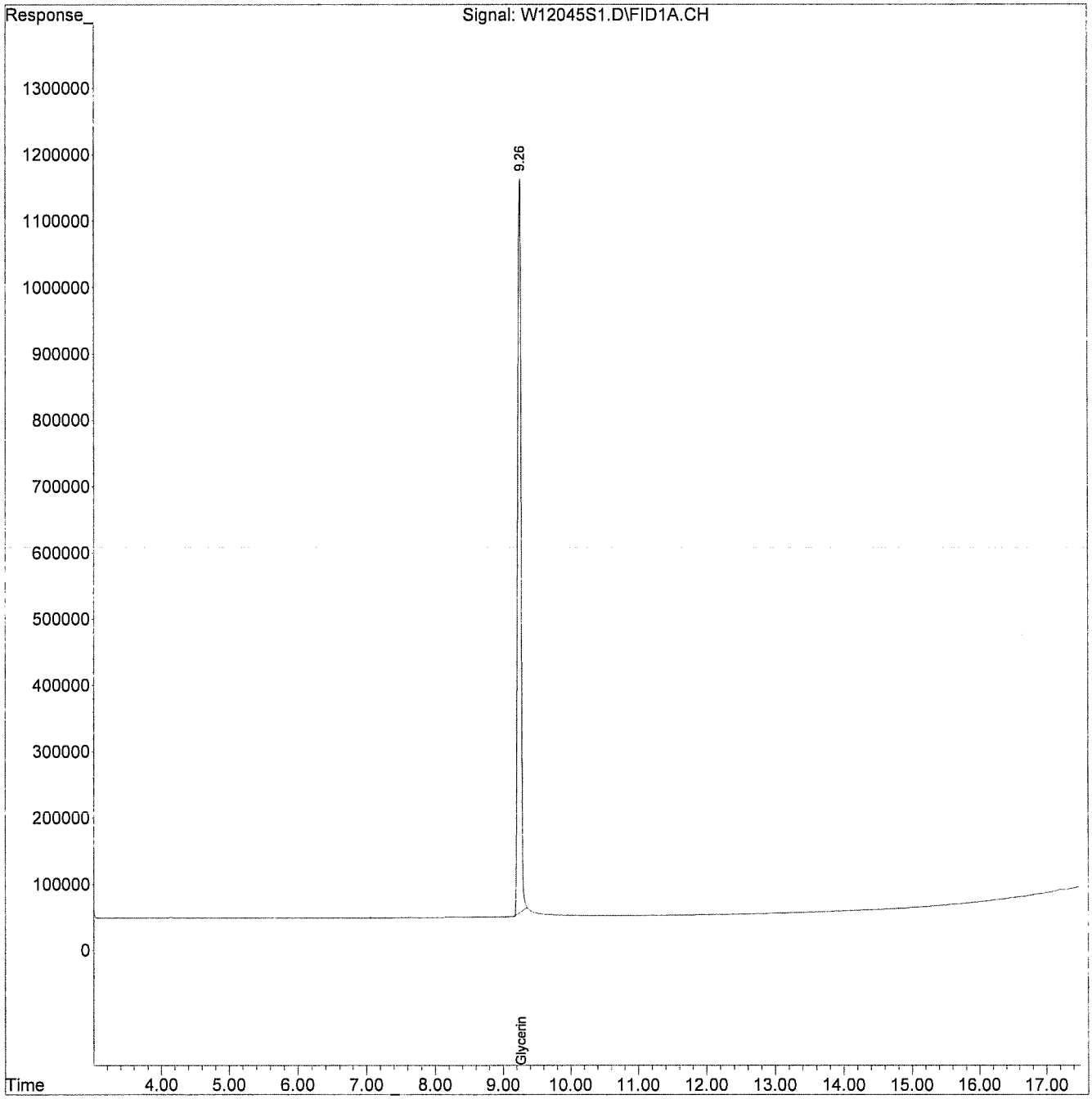
JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W12045S1.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 3:10 pm
Operator : AYY
Sample : Glycerin 2.331 mg/mL
Misc : 566-STD5-Lab202-2015
ALS Vial : 1 Sample Multiplier: 1

Ay 12/4/15

Integration File: events.e
Quant Time: Dec 04 17:39:46 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W12045S1.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 3:10 pm
Operator : AYY
Sample : Glycerin 2.331 mg/mL
Misc : 566-STD5-Lab202-2015
ALS Vial : 1 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 04 17:39:46 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) Glycerin	9.26	38264002	2.35217 mg/mL

(f)=RT Delta > 1/2 Window (m)=manual int.

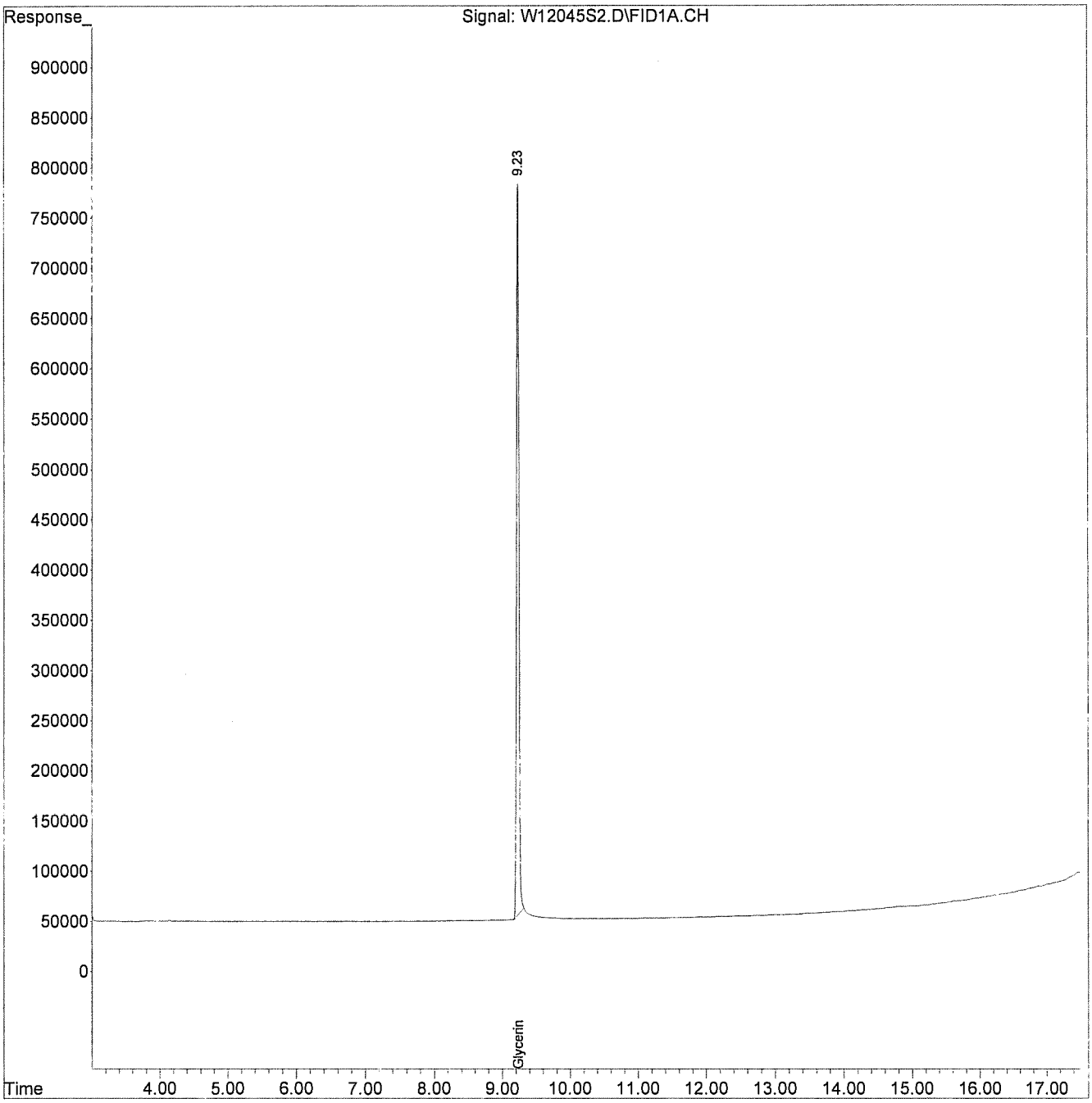
Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W12045S2.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 3:31 pm
Operator : AYY
Sample : Glycerin 1.1655 mg/mL
Misc : 566-STD4-Lab202-2015
ALS Vial : 2 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 04 16:05:08 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:05:00 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W12045S2.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 3:31 pm
Operator : AYY
Sample : Glycerin 1.1655 mg/mL
Misc : 566-STD4-Lab202-2015
ALS Vial : 2 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 04 16:05:08 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:05:00 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) Glycerin	9.23	17083530	1.04071 mg/mL

(f)=RT Delta > 1/2 Window (m)=manual int.

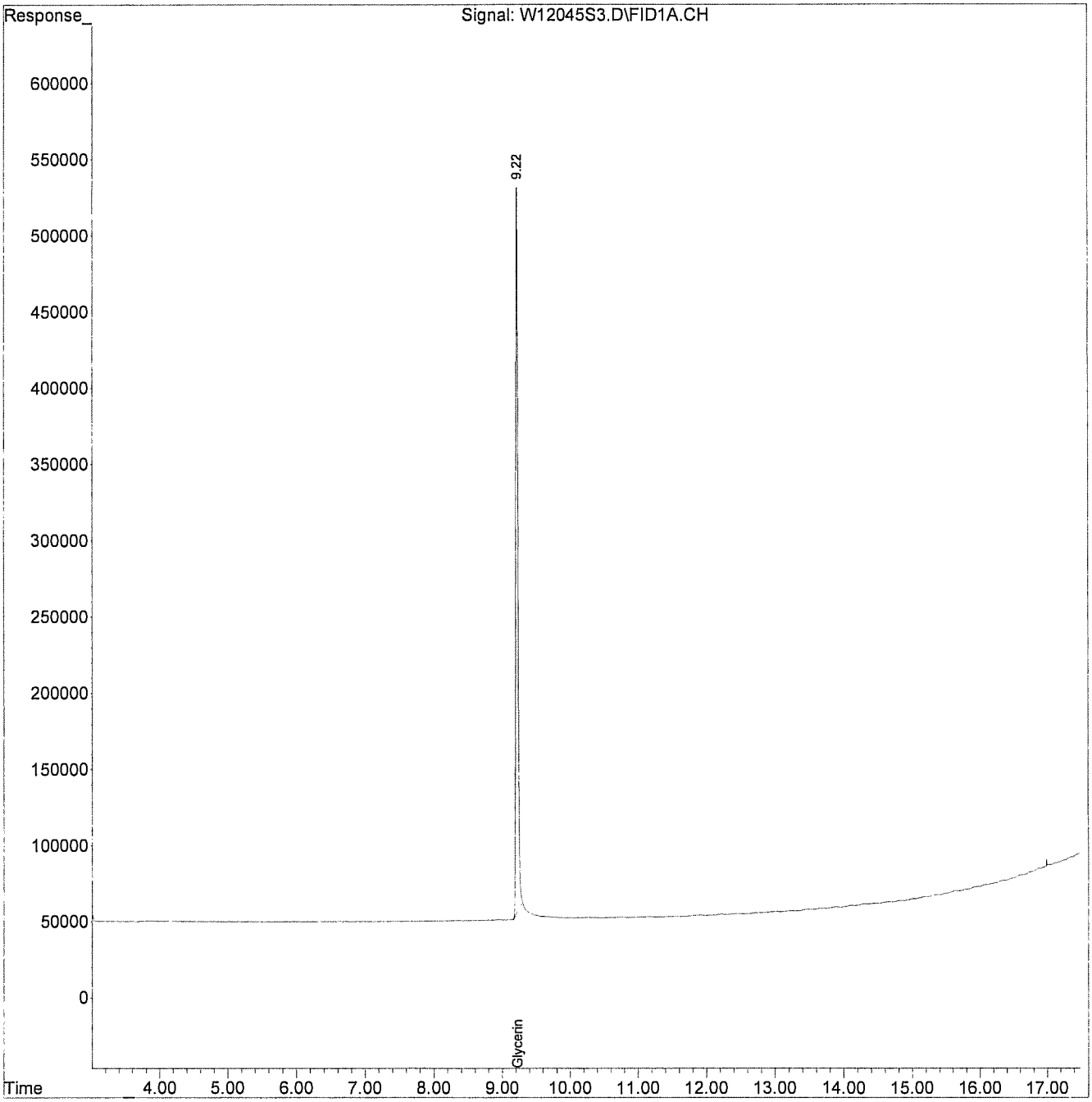
Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W12045S3.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 3:52 pm
Operator : AYY
Sample : Glycerin 0.6993 mg/mL
Misc : 566-STD3-Lab202-2015
ALS Vial : 3 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 04 16:10:19 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:05:57 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W12045S3.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 3:52 pm
Operator : AYY
Sample : Glycerin 0.6993 mg/mL
Misc : 566-STD3-Lab202-2015
ALS Vial : 3 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 04 16:10:19 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:05:57 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) Glycerin	9.22	9859620	0.76799 mg/mL

(f)=RT Delta > 1/2 Window (m)=manual int.

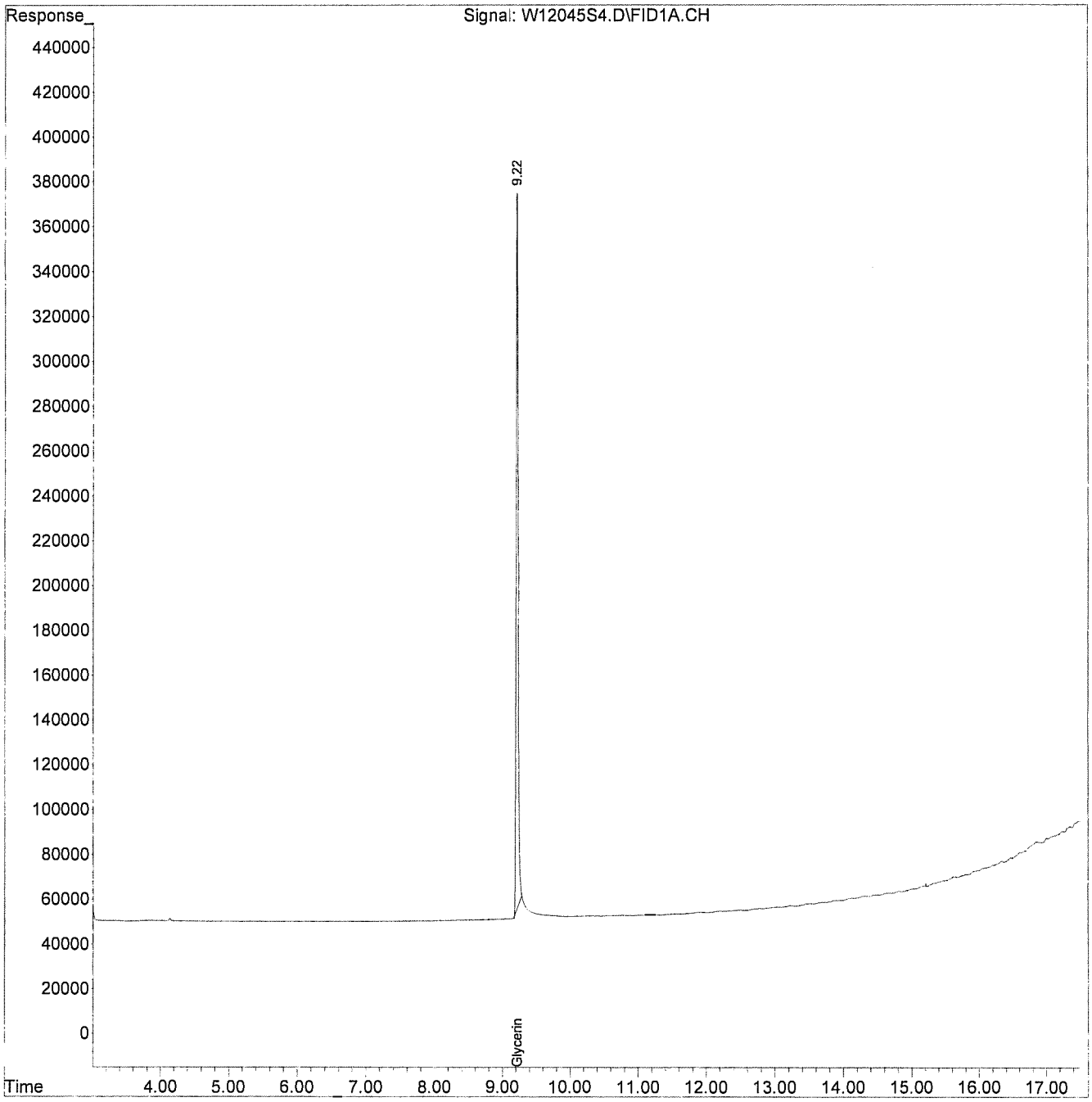
Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W12045S4.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 4:13 pm
Operator : AYY
Sample : Glycerin 0.4662 mg/mL
Misc : 566-STD2-Lab202-2015
ALS Vial : 4 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 04 16:48:21 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:10:37 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W12045S4.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 4:13 pm
Operator : AYY
Sample : Glycerin 0.4662 mg/mL
Misc : 566-STD2-Lab202-2015
ALS Vial : 4 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 04 16:48:21 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:10:37 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) Glycerin	9.22	6193819	0.51327 mg/mL

(f)=RT Delta > 1/2 Window (m)=manual int.

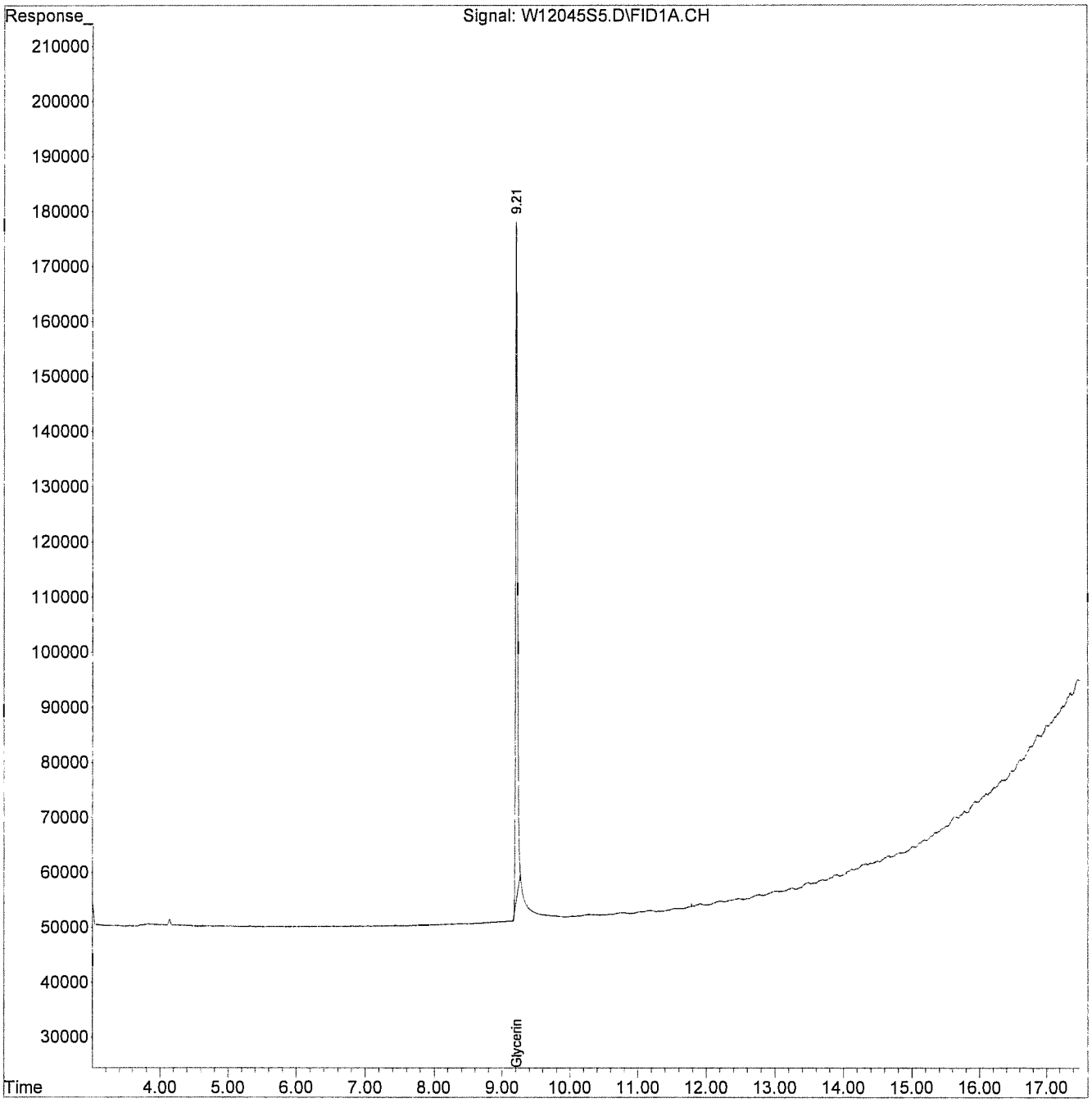
Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W12045S5.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 4:35 pm
Operator : AYY
Sample : Glycerin 0.2331 mg/mL
Misc : 566-STD1-Lab202-2015
ALS Vial : 5 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 04 17:44:19 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W12045S5.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 4:35 pm
Operator : AYY
Sample : Glycerin 0.2331 mg/mL
Misc : 566-STD1-Lab202-2015
ALS Vial : 5 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 04 17:44:19 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) Glycerin	9.21	2246451	0.25068 mg/mL

(f)=RT Delta > 1/2 Window (m)=manual int.

JANUARY 18, 2016

Southwest Research Institute

Glycerin Initial Calibration Verification

Project Number: 20859.01.00X
Client: CH2M Hill Plateau Remediation
File ID: W12045C1

SDG: ~~580358~~ 588637 Ay 01/18/16
Initial Calibration Date: 12/04/15
Calibration verification date: 12/04/2015 16:56

Compound	Theoretical Conc (mg/mL)	Calculated Conc (mg/mL)	Acceptable Range 75% - 125%	
Glycerin	1.046	1.0187	0.78	1.31

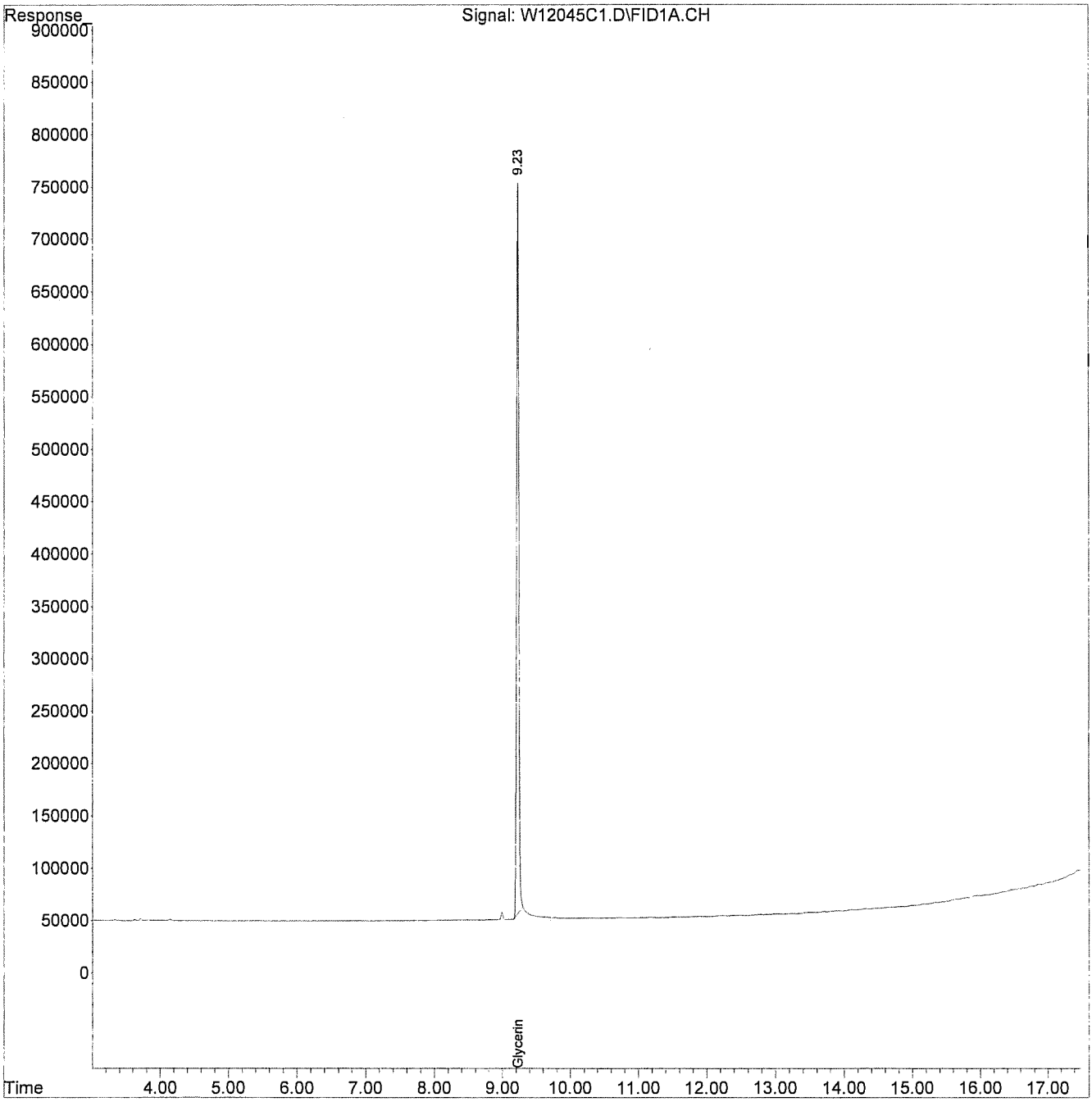
Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W12045C1.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 4:56 pm
Operator : AYY
Sample : Glycerin check 1.046 mg/mL
Misc : 566-01-Lab202-2015
ALS Vial : 6 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 04 17:46:54 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W12045C1.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 4:56 pm
Operator : AYY
Sample : Glycerin check 1.046 mg/mL
Misc : 566-01-Lab202-2015
ALS Vial : 6 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 04 17:46:54 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) Glycerin	9.23	15410313	1.01874 mg/mL

(f)=RT Delta > 1/2 Window (m)=manual int.

JANUARY 18, 2016

Southwest Research Institute

Glycerin Continuing Calibration Check Sheet

Project Number: 20859.01.00X
Client: CH2M Hill Plateau Remediation
File ID: W12045S6

SDG: 588637
Initial Calibration Date: 12/04/15
Calibration verification date: 12/04/2015 18:42

Compound	Theoretical Conc (mg/mL)	Calculated Conc (mg/mL)	Acceptable Range 75% - 125%	
Glycerin	0.6993	0.7111	0.52	0.87

* Value outside advisory limits of 75% - 125%.

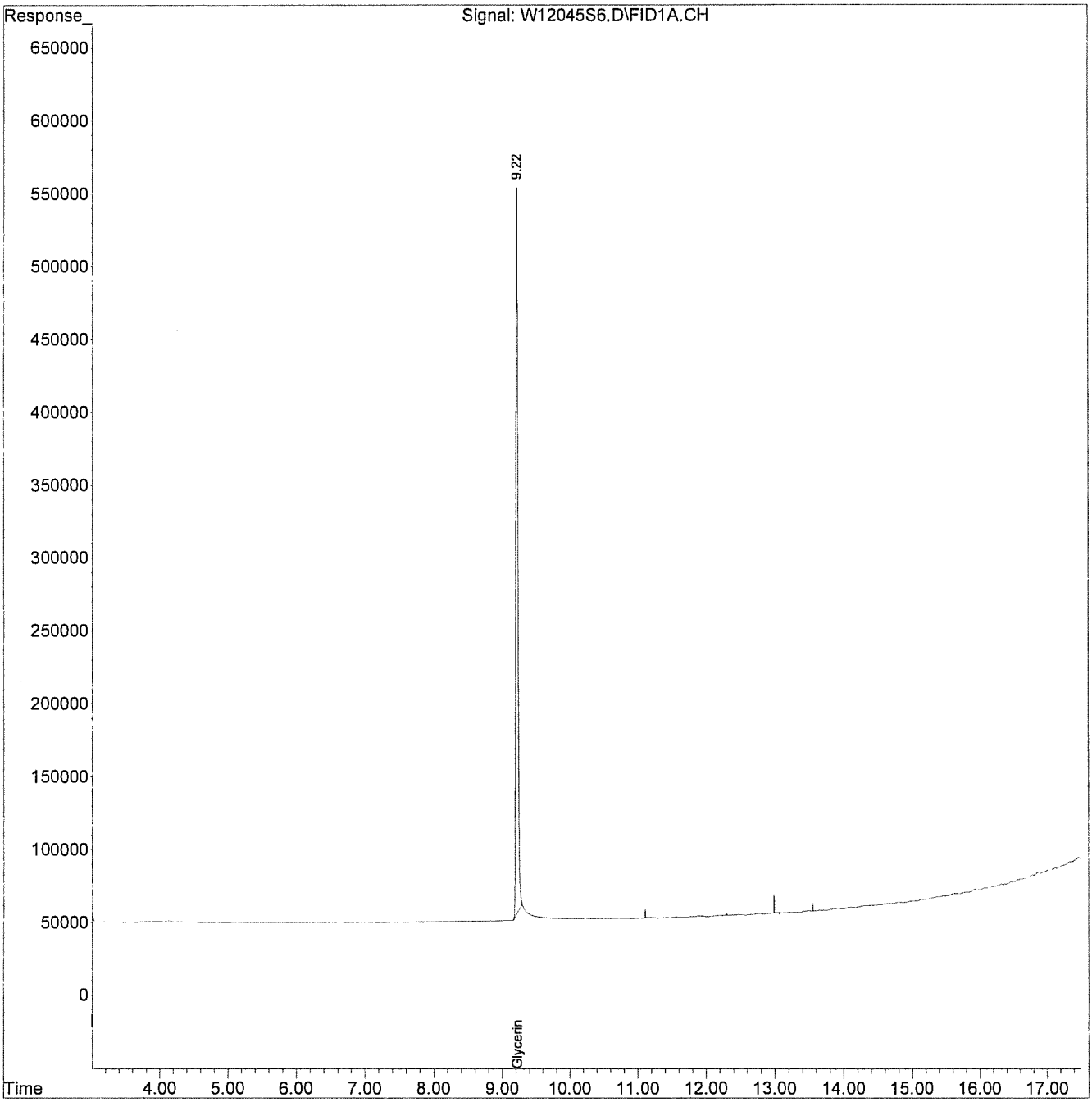
Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W12045S6.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 6:42 pm
Operator : AYY
Sample : Glycerin CCV 0.6993 mg/mL
Misc : 566-STD3-Lab202-2015
ALS Vial : 11 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 07 08:41:31 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

JANUARY 18, 2016

Data Path : C:\MSDChem\2\DATA\2015\W120415\
Data File : W12045S6.D
Signal(s) : FID1A.CH
Acq On : 04 Dec 2015 6:42 pm
Operator : AYY
Sample : Glycerin CCV 0.6993 mg/mL
Misc : 566-STD3-Lab202-2015
ALS Vial : 11 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 07 08:41:31 2015
Quant Method : C:\MSDCHEM\2\METHODS\GLYCEROL.M
Quant Title : Glycerin GC/FID analysis
QLast Update : Fri Dec 04 16:53:20 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) Glycerin	9.22	10138196	0.71113 mg/mL

(f)=RT Delta > 1/2 Window (m)=manual int.

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 151203-2
SwRI SRR: 56649
SDG: 588637
VTSR: 12.03.2015

Glycerin GC/FID Injection Log

Glycerin analysis

Continued from Page

injlog

Southwest Research Institute GC-FID Injection Log

OPERATOR: AYY SEQUENCE DATE: 12/04/15 INSTRUMENT: Windu
COLUMN: Agilent DB-624 (30 m; 0.25 mm ID; 1.4 µm)
CARRIER GAS: Helium 1.5 mL/min SOLVENT: Methanol
METHOD FILE: GLYCERIN.M
CLIENT NAME: CH2M Hill Plateau Remediation PROJECT NUMBER: 20859.01.00X
SRR: 56649 METHOD: GC-FID MATRIX: Liquid
DATA PATH: C:\MSDChem\2\DATA\2015\W120415

OVEN PROGRAM
Initial temp: 80 C Equilibration time: 0.5 min
Initial time: 0.5 min
Ramps:

#	Rate	Final temp	Final time
1	10.00	250	0.00

Run time: 17.50 min

FILENAME	VIAL	DATE/TIME	METHOD	SAMPLE DESCRIPTION
W12045S1	1	12/04/15 15:10	GLYCERIN	Glycerin 2.331 mg/mL
W12045S2	2	12/04/15 15:31	GLYCERIN	Glycerin 1.1655 mg/mL
W12045S3	3	12/04/15 15:52	GLYCERIN	Glycerin 0.6993 mg/mL
W12045S4	4	12/04/15 16:13	GLYCERIN	Glycerin 0.4662 mg/mL
W12045S5	5	12/04/15 16:35	GLYCERIN	Glycerin 0.2331 mg/mL
W12045C1	6	12/04/15 16:56	GLYCERIN	Glycerin check 1.046 mg/mL
W1204501	7	12/04/15 17:17	GLYCERIN	Methanol blank
W1204502	8	12/04/15 17:39	GLYCERIN	588638 (7.686 mg/mL)
W1204503	9	12/04/15 18:00	GLYCERIN	588637 (7.1468 mg/mL)
W1204504	10	12/04/15 18:21	GLYCERIN	588637 DUP (7.072 mg/mL)
W12045S6	11	12/04/15 18:42	GLYCERIN	Glycerin CCV 0.6993 mg/mL

END OF SEQUENCE

Ayan 12/07/15

Ayan

REVIEWED BY: [signature]
DATE: 12/07/15

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Work continued to Page

SIGNATURE Alice Yan DATE 12/7/15

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 151203-2
SwRI SRR: 56649
SDG: 588637
VTSR: 12.03.2015

Glycerin GC/FID
Solution Preparation

JANUARY 18, 2016

Glycerol Stock Solution and calibration curve

SwRI Labs

Book: TDG
Volume: LAB 202 2015
Page: 566
Section 1 of 1

Project: 20859.01.00X Solution prepared on 12/04/15 by RB
Client : CH2M Hill Plateau Remediation Company

566-01-LAB202-2015 1mg/mL Glycerol Stock Solution
104.62mg of Glycerol, (Acros, Lot# 1531810, Exp.AUG2020), was weighed directly into a 100mL volumetric flask and diluted w/ Methanol, (Fisher Optima, Lot# 155003, Exp.JUL2020).
Conc. = 1.046mg/mL

Balance #26, Lab 201, Bldg.199

Solution Expires 06/04/16

The above glycerol stock solution will be used as a second source verification.

GLYCEROL CALIBRATION CURVE (prepared by A Yau on 12/04/15)

566-STD5-LAB202-2015
23.31 mg of Glycerol (Acros, Lot# 1531810, Exp.AUG2020), was weighed directly into a 10 mL Class A volumetric flask and diluted using methanol.
Conc = 2.331 mg/mL

566-STD4-LAB202-2015
1 mL of 566-STD5-LAB202-2015 diluted to a final volume of 2 mL methanol using Class A volumetric flask.
Conc = 1.1655 mg/mL

566-STD3-LAB202-2015
1.5 mL of 566-STD5-LAB202-2015 diluted to a final volume of 5 mL methanol using Class A volumetric flask.
Conc = 0.6993 mg/mL

566-STD2-LAB202-2015
1 mL of 566-STD5-LAB202-2015 diluted to a final volume of 5 mL methanol using Class A volumetric flask.
Conc = 0.4662 mg/mL

566-STD1-LAB202-2015
0.5 mL of 566-STD5-LAB202-2015 diluted to a final volume of 5 mL methanol using Class A volumetric flask.
Conc = 0.2331 mg/mL

Methanol used: OmniSolv Lot: 53270 opened Feb 2015 Exp: Feb 2020
Syringe used: Fisher Gastight #1001 SN: 13162
Balance used: 112 (MT Model: XP205)

Page created Dec 4 2015 9:31AM by rbalderaz
Approved by JENNIFER WALTERS on Dec 7 2015 11:22AM

Date Printed: Dec 7 2015 11:29AM

JANUARY 18, 2016

Glycerol sample preparation

X34557

SwRI Labs
Client: CH2M Hill Plateau Remediation Company
Project: 20859.01.00X
Case: 303953

Sample Receipt: 56649
TO#: 151203-2

DATE	12/04/2015	METHANOL USED	OmniSolv Lot: 53270 LCMS grade; Exp: Feb 2020
ANALYST	A Yau		
BALANCE USED	112 (MT Model: XP205)	VOLUME ADJ	25 mL Class A volumetric flask

	System ID	Type	Customer ID	WEIGHT	VOLUME	CONC
1	588637		B33Y75	178.67 mg	25.0 mL	7.1468
2	588637	DUP	B33Y75	176.80 mg	25.0 mL	7.0720
3	588638		B33Y76	192.15 mg	25.0 mL	7.6860
4	588787	BLK	MB_04DEC15	0.00 mg	25.0 mL	0.0000

Page created Dec 4 2015 4:55PM by ayau
Book: TDG, Volume: LAB 102 2015, Page: 83 (Section 1 of 1)
Approved by JENNIFER WALTERS on Dec 7 2015 11:22AM

Date Printed: 12/07/2015

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 151203-2
SwRI SRR: 56649
SDG: 588637
VTSR: 12.03.2015

Fluorescent Brightner 220
(CAS 16470-24-9)

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 151203-2
SwRI SRR: 56649
SDG: 588637
VTSR: 12.03.2015

Fluorescent Brightner 220

Sample Results

JANUARY 18, 2016

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Liquid

SRR #: 56649

Task Order #: 151203-2

Client: CH2M Hill Plateau Remediation Company

Project No.: 20859.01.00X

Date Received: 12/03/15

SDG: 588637

Sample ID	Lab System ID	Fluorescent Brightener 220 Concentration	Q	Reporting Limit	Units	Date Analyzed
Prep Blank	ICB	<0.00002%	U	0.00002%	%	01/15/16
Lab Control	ICV	0.912%		0.2%	%	01/15/16
True Value	-----	1.00%		-----	%	-----
Recovery	-----	91.2%		-----	-----	-----
B33Y75	588637	0.506%		0.05%	%	01/15/16
Duplicate result	588637D	0.528%		0.05%	%	01/15/16
RPD	-----	4.26%		-----	-----	-----
Spike result	588637S	0.744%		0.05%	%	01/15/16
Spike added	-----	0.245%		-----	%	-----
Recovery	-----	97.2%		-----	-----	-----
B33Y76	588638	0.479%		0.05%	%	01/15/16

"U" in the Q (qualifier) column indicates undetected.

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SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 151203-2
SwRI SRR: 56649
SDG: 588637
VTSR: 12.03.2015

Fluorescent Brightner 220

Raw Data

Southwest Research Institute

Fluorescent Brightener 220

Controlled Electronic Benchsheet

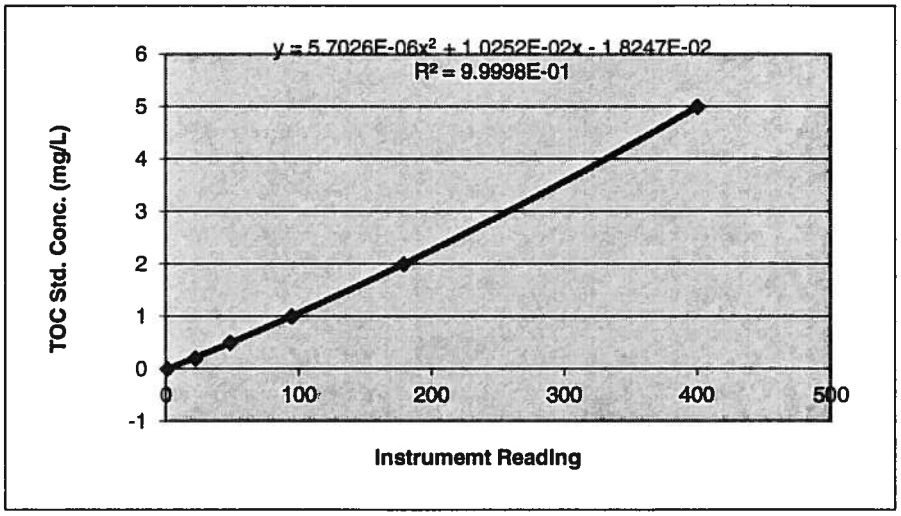
Client: CH2M Hill Plateau Remediation Company
Project #: 20859.01.00X
TO#: 151203-2
Method: SWRI

Date: 01/15/16
Analyst: Rspies
RL = 0.0000002
0.00%
Sig Figs: 3

STANDARDIZATION:

True Value mg/L	Average Instrument Reading	Recalc Values mg/L
5	400	5.0
2	179	2.0
1	94.5	1.0
0.5	48.5	0.5
0.2	22.4	0.2
0	1.00	-0.01

Quadratic Coefficients:	
A	5.7026E-06
B	1.0252E-02
C	-1.8247E-02
Coff.	9.9998E-01



Conc. (mg/L) from curve = A (Reading)^2 + [B x (Reading)] + C

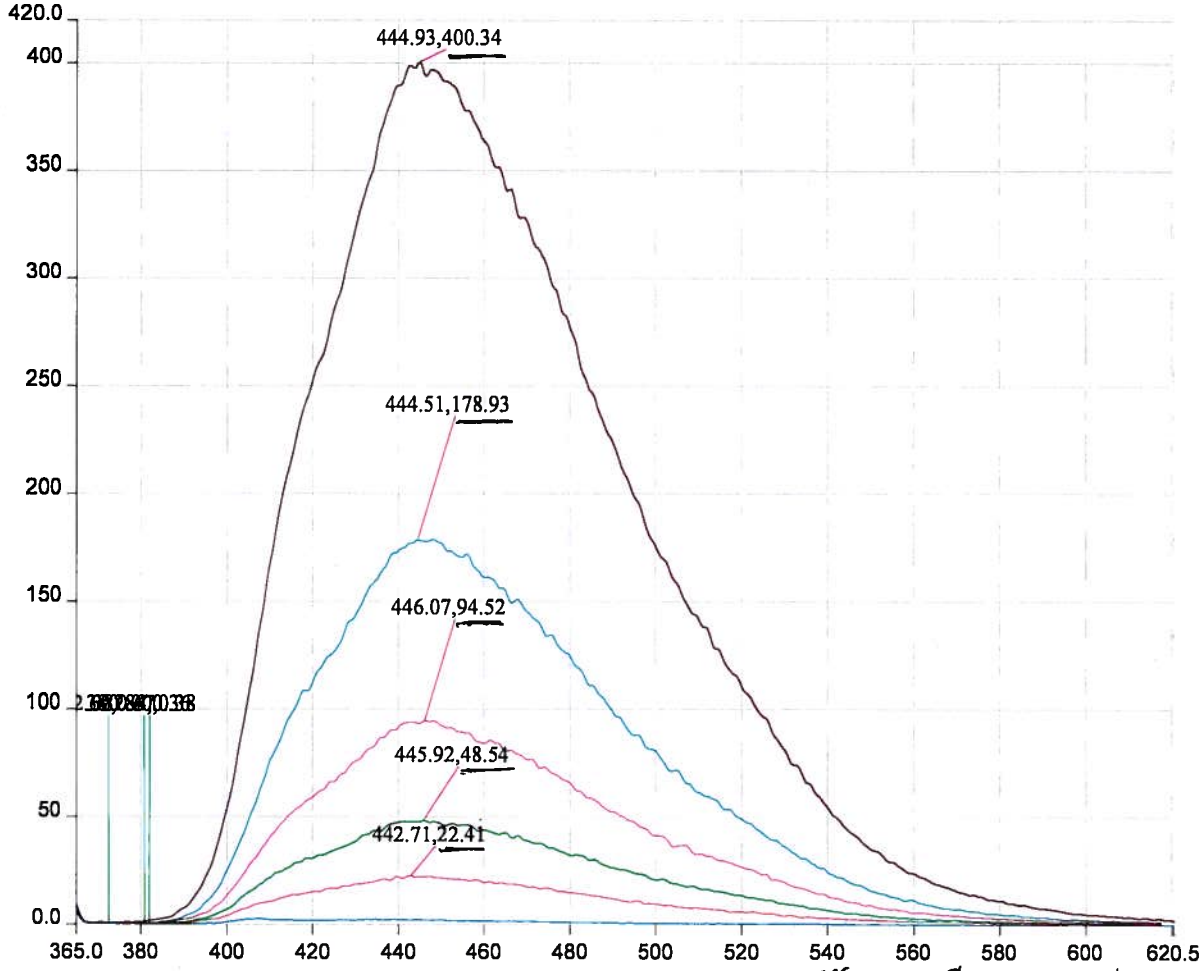
Calibration Source: 26-01-WCS12 TV = 1000 mg/L
ICV/CCV/LCSW Source: 28-01-WCS12 TV = 10000 mg/kg or 1%
MS Source: 26-01-WCS12 Spike TV = 1.0 mg/L or 0.245%

NOTES:

Seq #	Sample ID	DF	Density	Instument Reading	Conc.	RL	%Rec
1	ICV	10000	1.00	86.56	0.912%	0.2%	91.2% R, TV =1.0%
2	ICB	1	1.00	1.51	<0.00002%	0.00002%	
3	588637	10000	1.02	42.05	0.415%	0.2%	void - run less dilute
4	588637D	10000	1.02	42.43	0.419%	0.2%	void - run less dilute
5	588637S	10000	1.02	210.45	2.345%	0.2%	void - run less dilute
6	588638	10000	1.02	43.15	0.426%	0.2%	
7	588637	2500	1.02	184.20	0.506%	0.05%	
8	588637D	2500	1.02	191.63	0.528%	0.05%	
9	588637S	2500	1.02	260.18	0.744%	0.05%	97.2% R, TV =0.245%
10	588638	2500	1.02	175.18	0.479%	0.05%	
11	CCV	10000	1.00	93.26	0.988%	0.2%	98.8% R, TV =1.0%
12	CCB	1	1.00	0.83	<0.00002%	0.00002%	

JANUARY 18, 2016

Date: 1/15/2016 Time: 11:42:35 AM



	Intensity	Conc, mg/L
OB_STD0#01.sp - 1/15/2016	~~10~~ RSS 1/15/16 1.0	0
OB_STD02#01.sp - 1/15/2016	~~48.54~~ RSS 1/15/16 22.41	0.2
OB_STD05#01.sp - 1/15/2016	~~94~~ RSS 1/15/16 48.54	0.5
OB_STD1#01.sp - 1/15/2016	94.52	1.0
OB_STD2#01.sp - 1/15/2016	178.93	2.0
OB_STD5#01.sp - 1/15/2016	400.34	5.0.

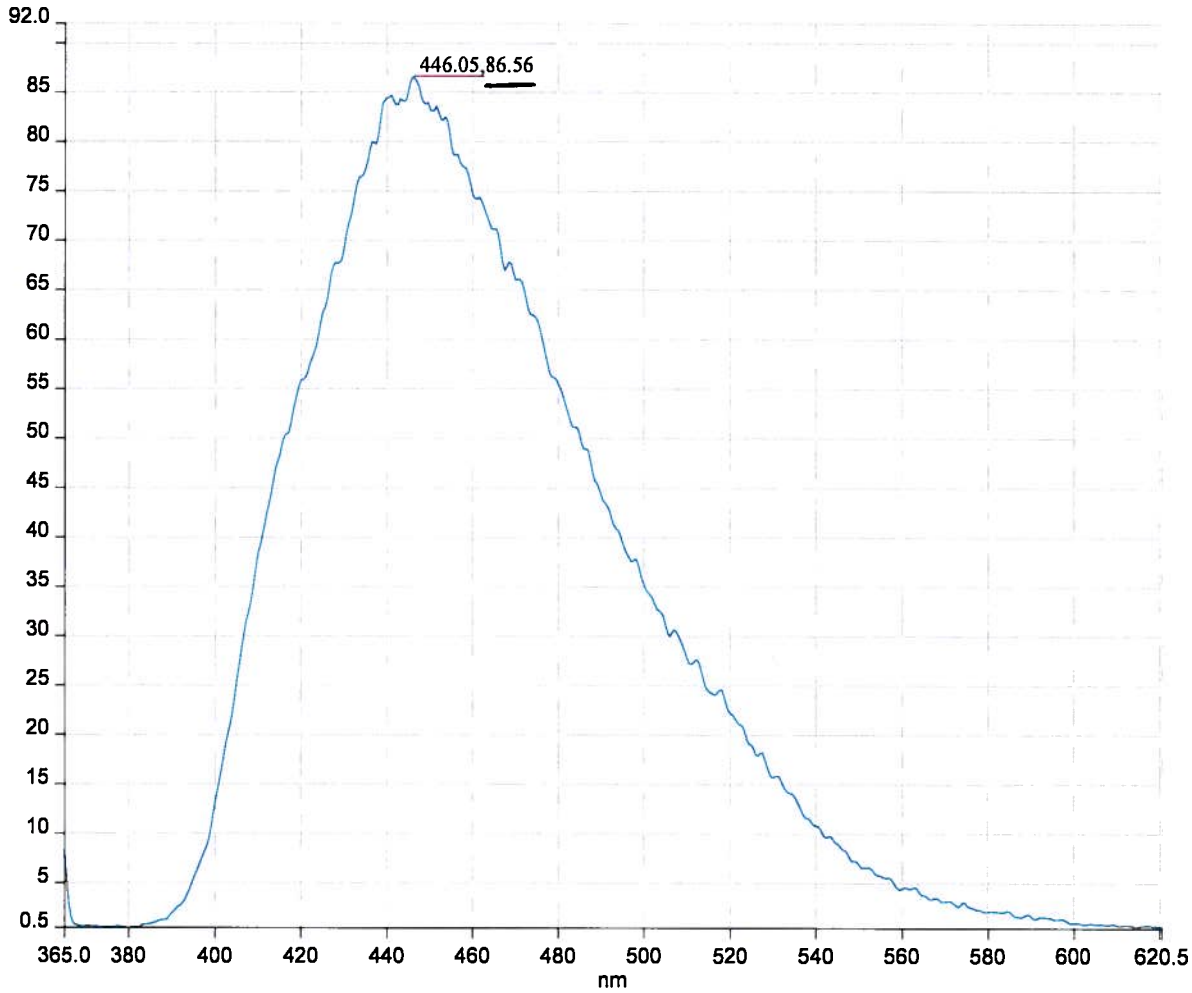
RSS 1/15/2016

350 nm excitation
Ex Slit (nm) - 5.0
Em Slit (nm) - 5.0
Scan Rate - 500 nm/min

start time:
9:45am 1/15/16
9:55 am 1/15/16

JANUARY 18, 2016

Date: 1/15/2016 Time: 11:49:05 AM



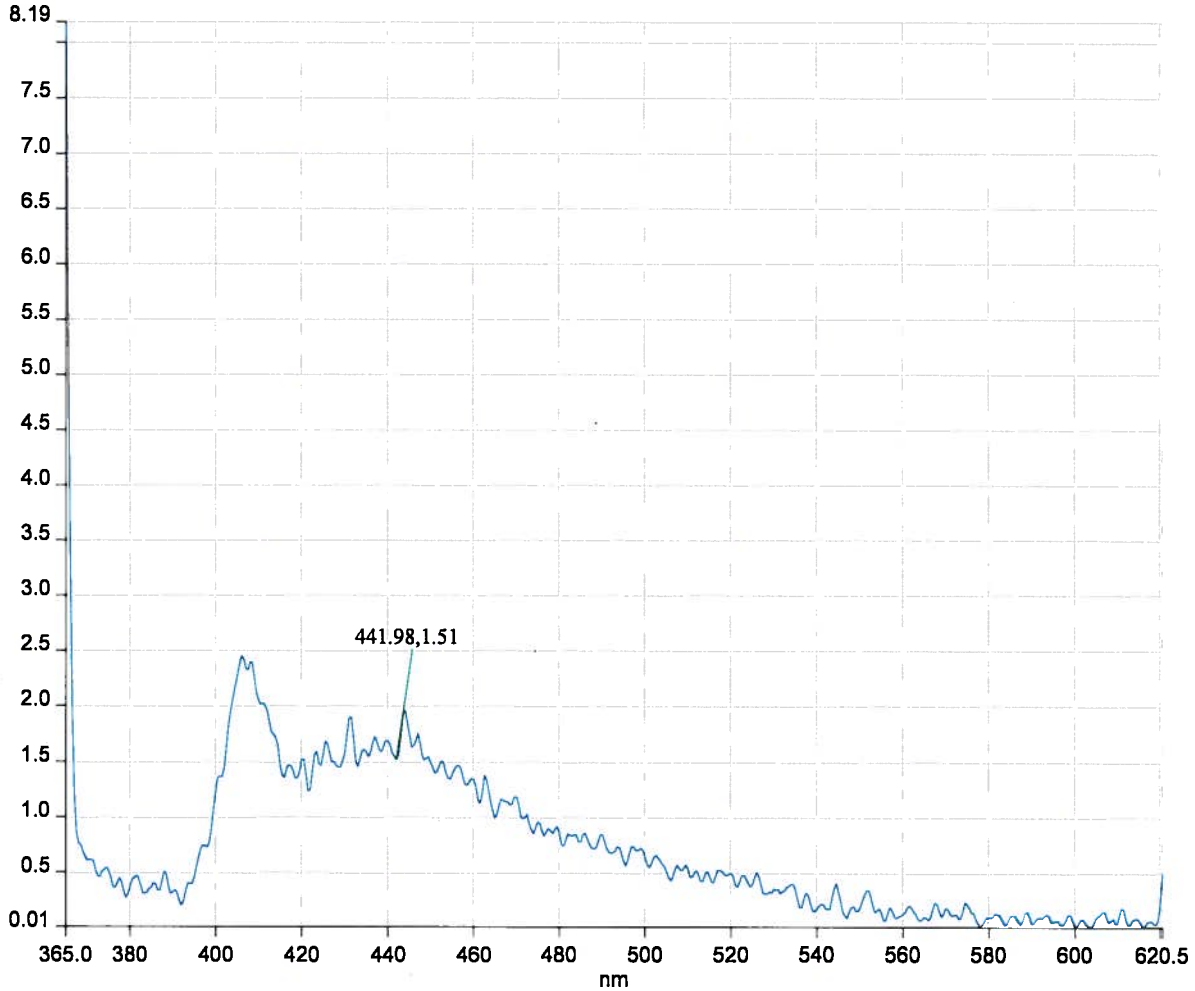
OB_ICV#01.sp - 1/15/2016 Intensity =

✓ RApus 1/15/16

9:56

JANUARY 18, 2016

Date: 1/15/2016 Time: 11:50:56 AM



RDpris
1/15/16

9:57

JANUARY 18, 2016

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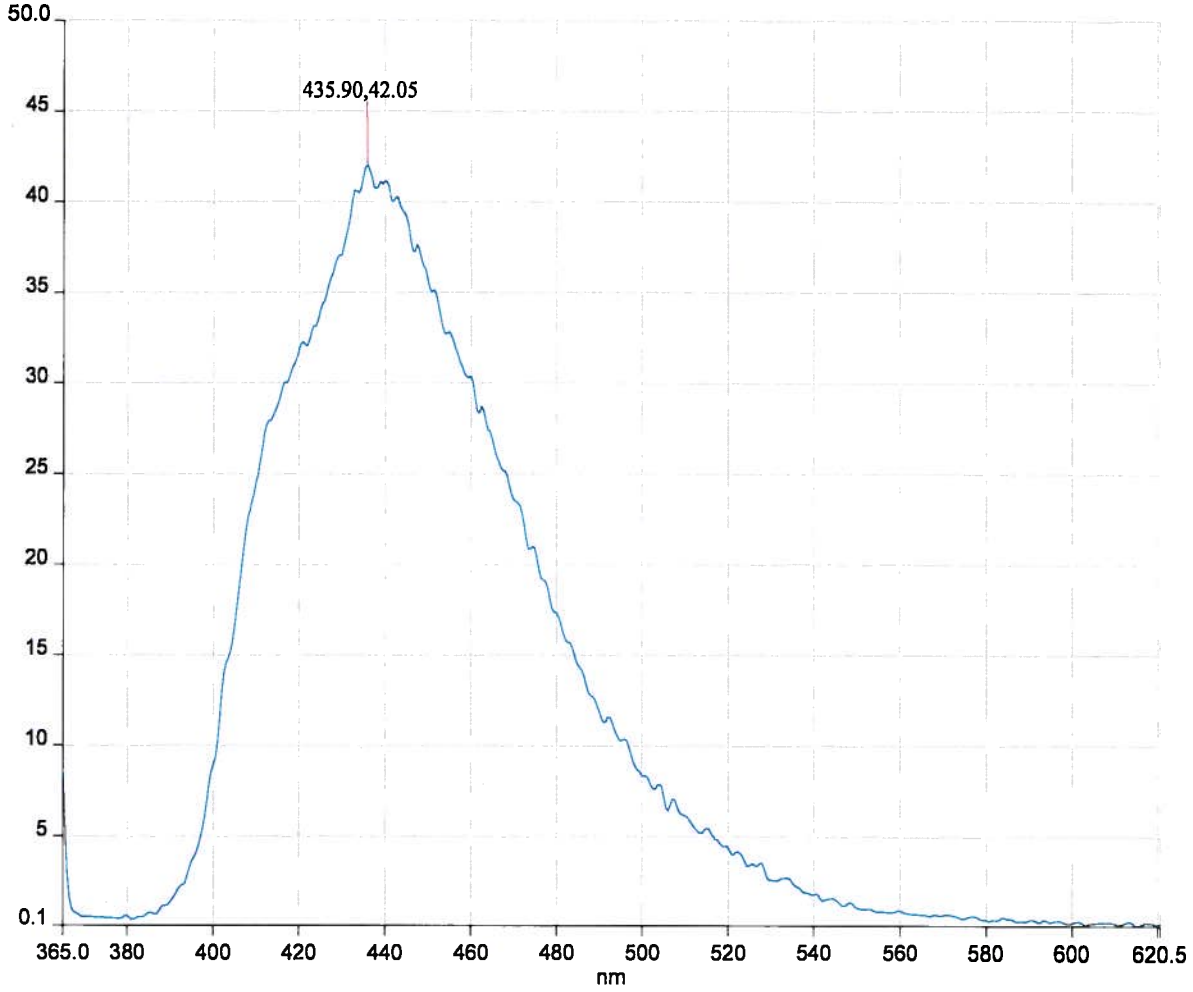


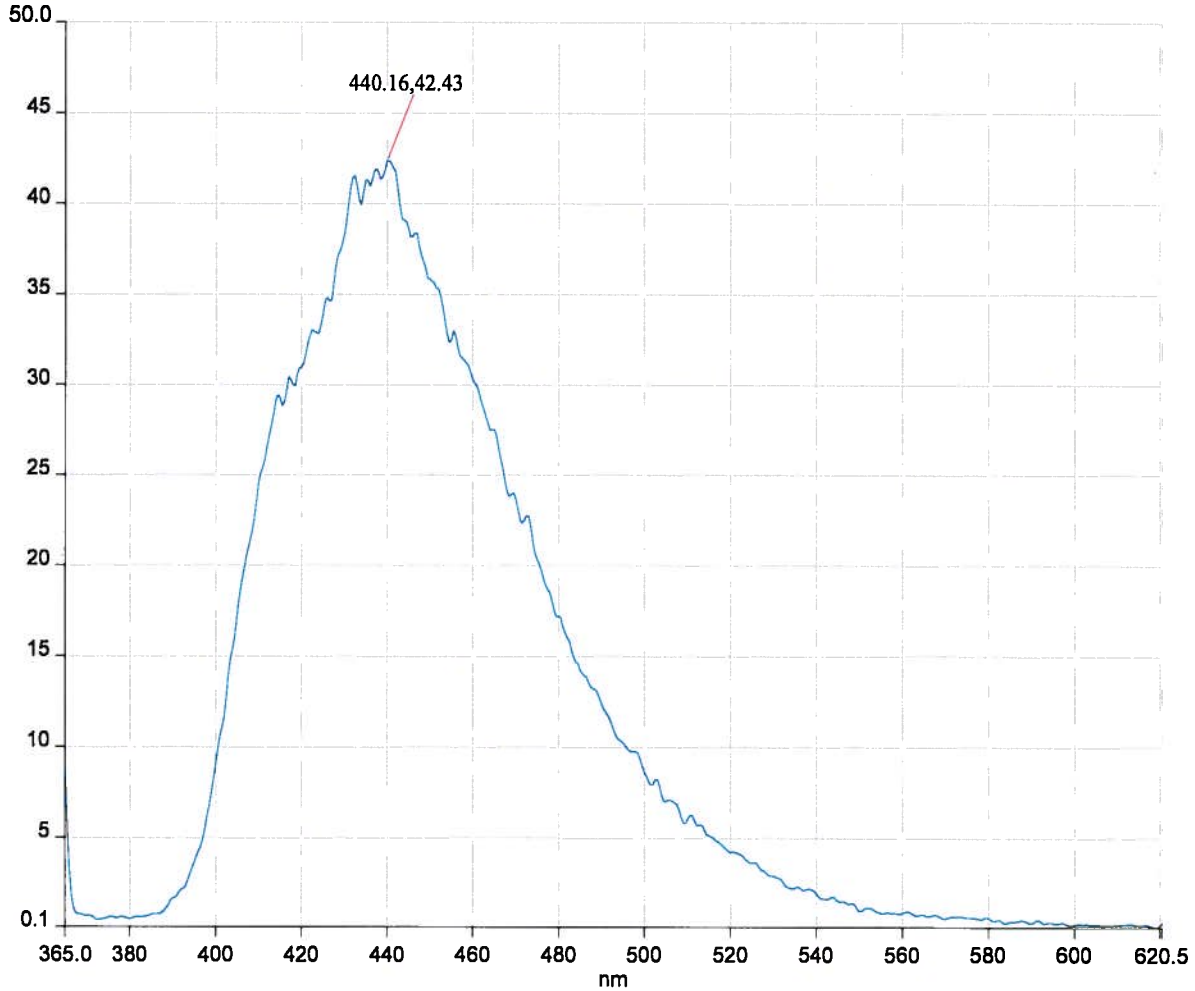
OB_588637DF10K#01.sp - 1/15/2016

Sample 5886337 DF10000
RSS
1/15/16

RSpis
1/15/16

JANUARY 18, 2016

Date: 1/15/2016 Time: 11:52:11 AM



OB_588637DDF10K#01.sp - 1/15/2016

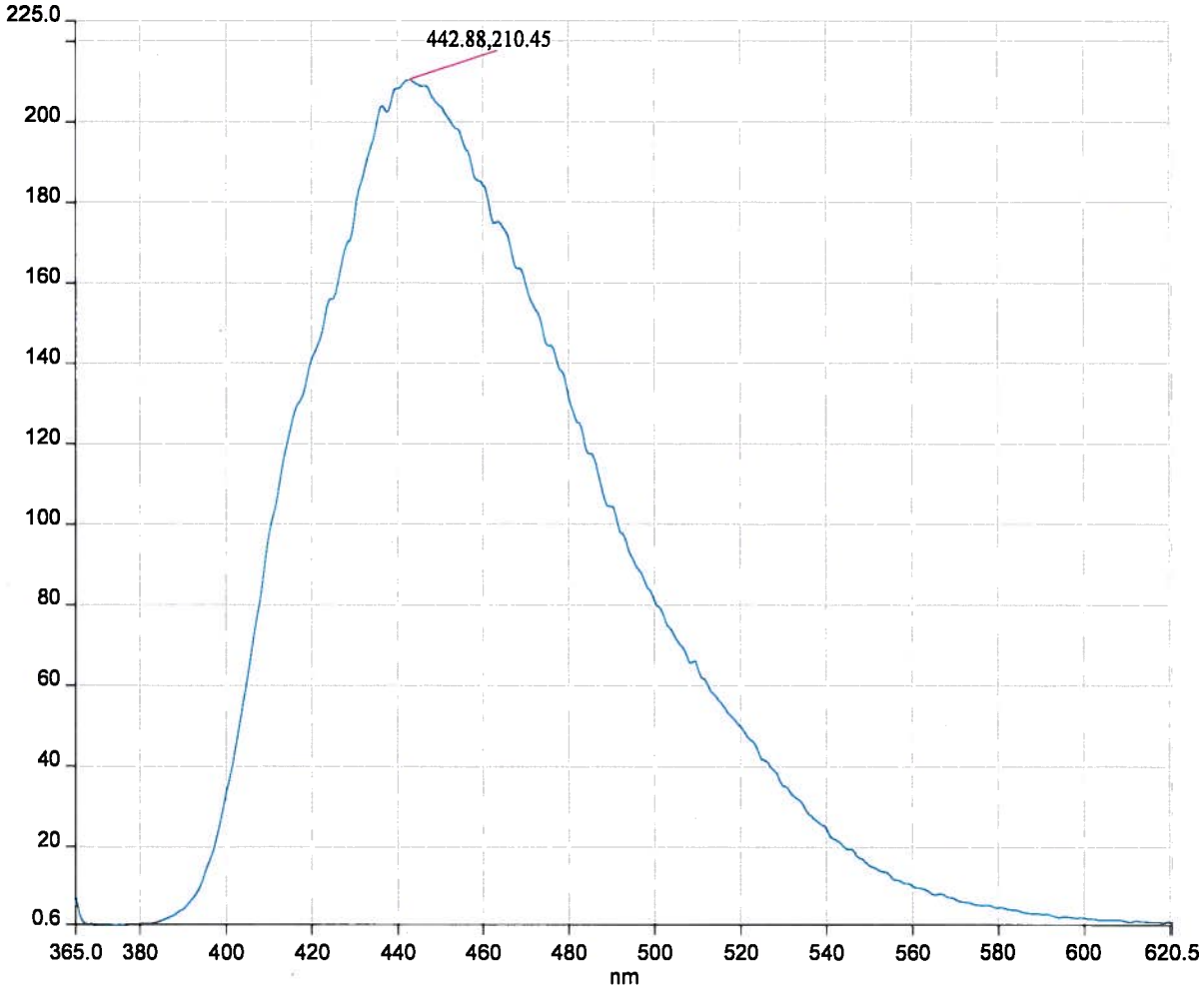
Sample 588637D DF 10,000

✓RSpris
1/15/16

9:59

JANUARY 18, 2016

Date: 1/15/2016 Time: 11:59:51 AM



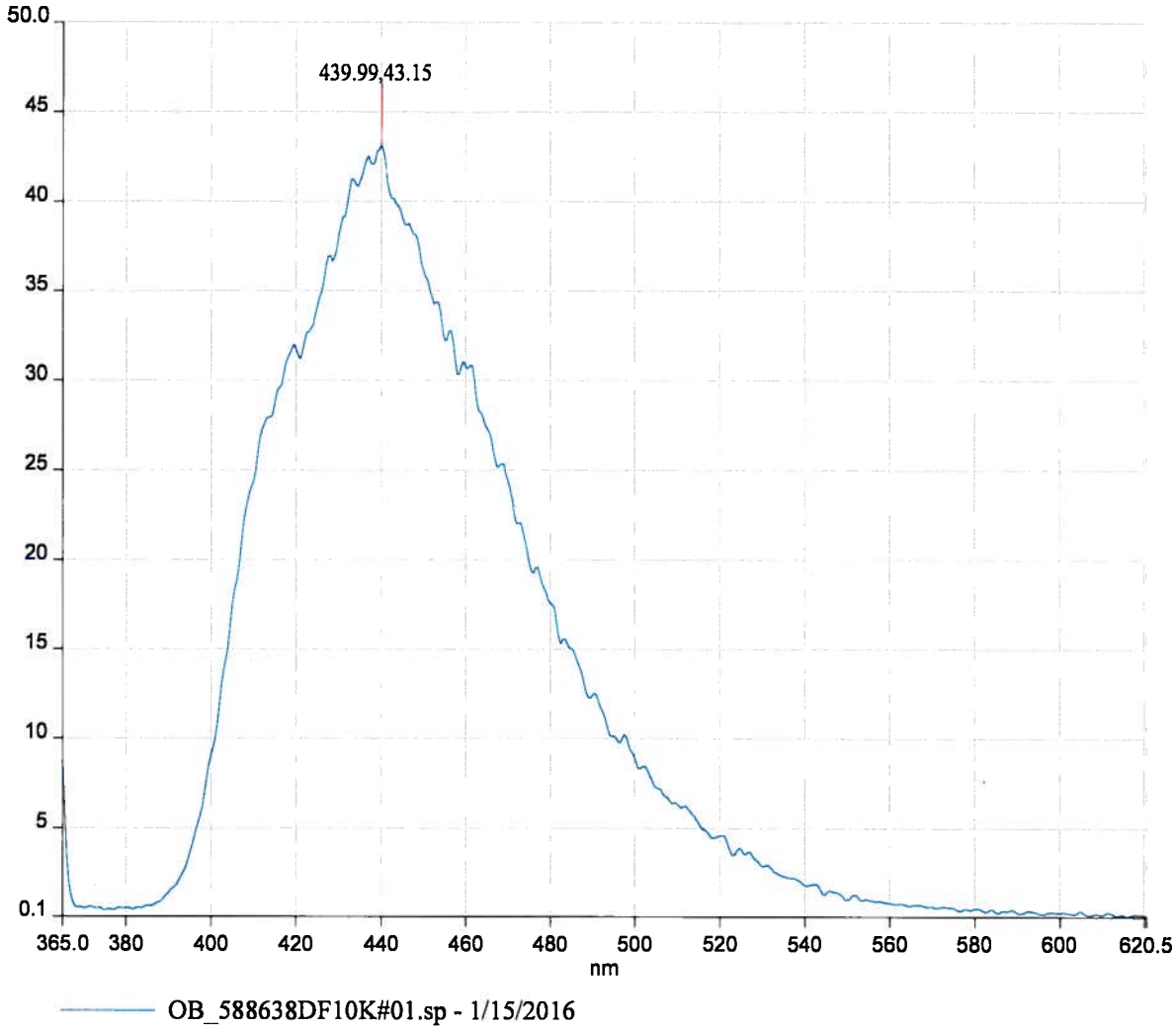
Sample 588637S DF 10,000

RSpin
1/15/16

10:00

JANUARY 18, 2016

Date: 1/15/2016 Time: 12:01:05 PM



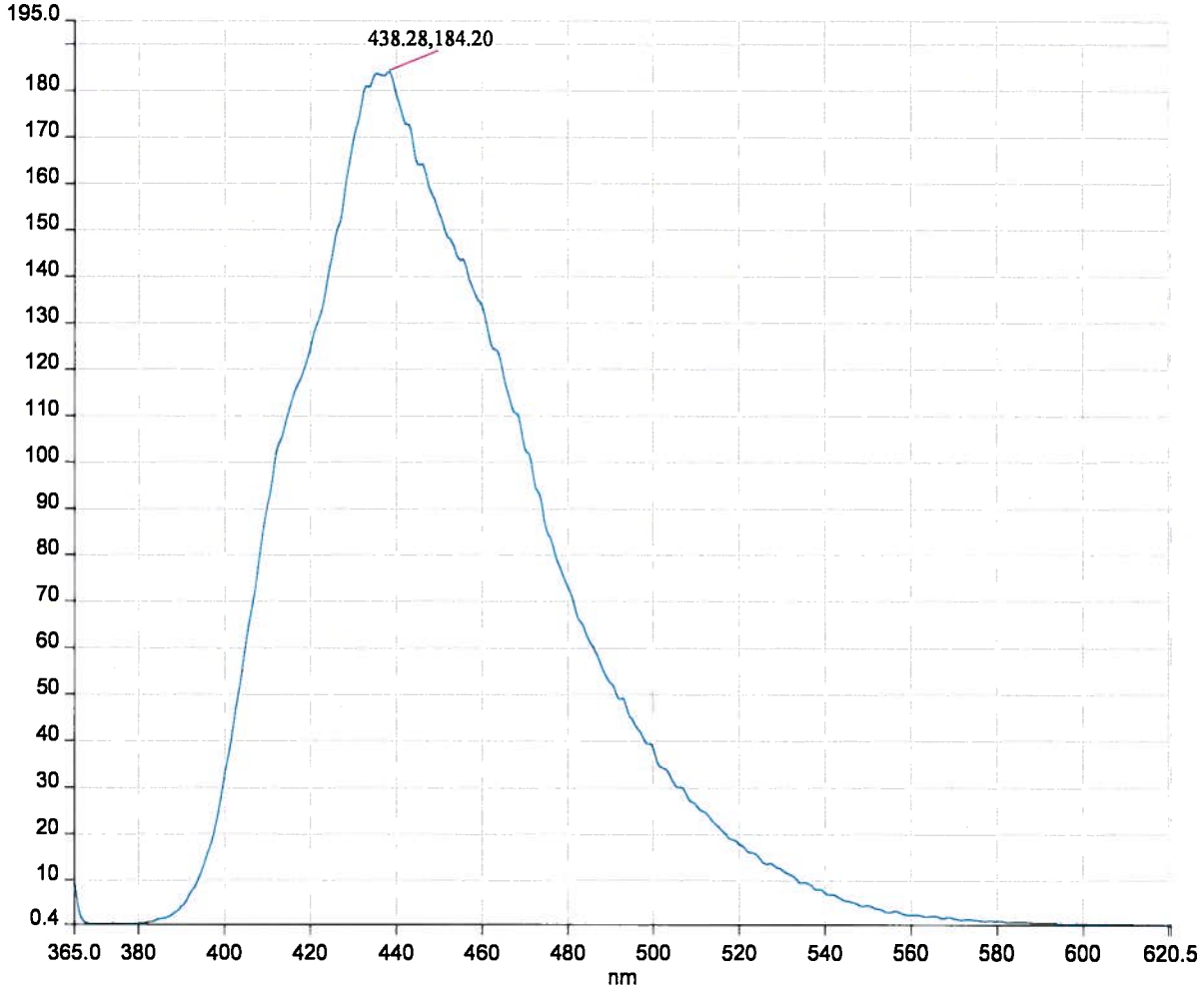
Sample 588638 DF 10,000

✓ R Spies
1/15/16

10:01 am

JANUARY 18, 2016

Date: 1/15/2016 Time: 11:59:11 AM



Sample 588637 DF 2500

RSpin 1/15/16

11:45 am

JANUARY 18, 2016

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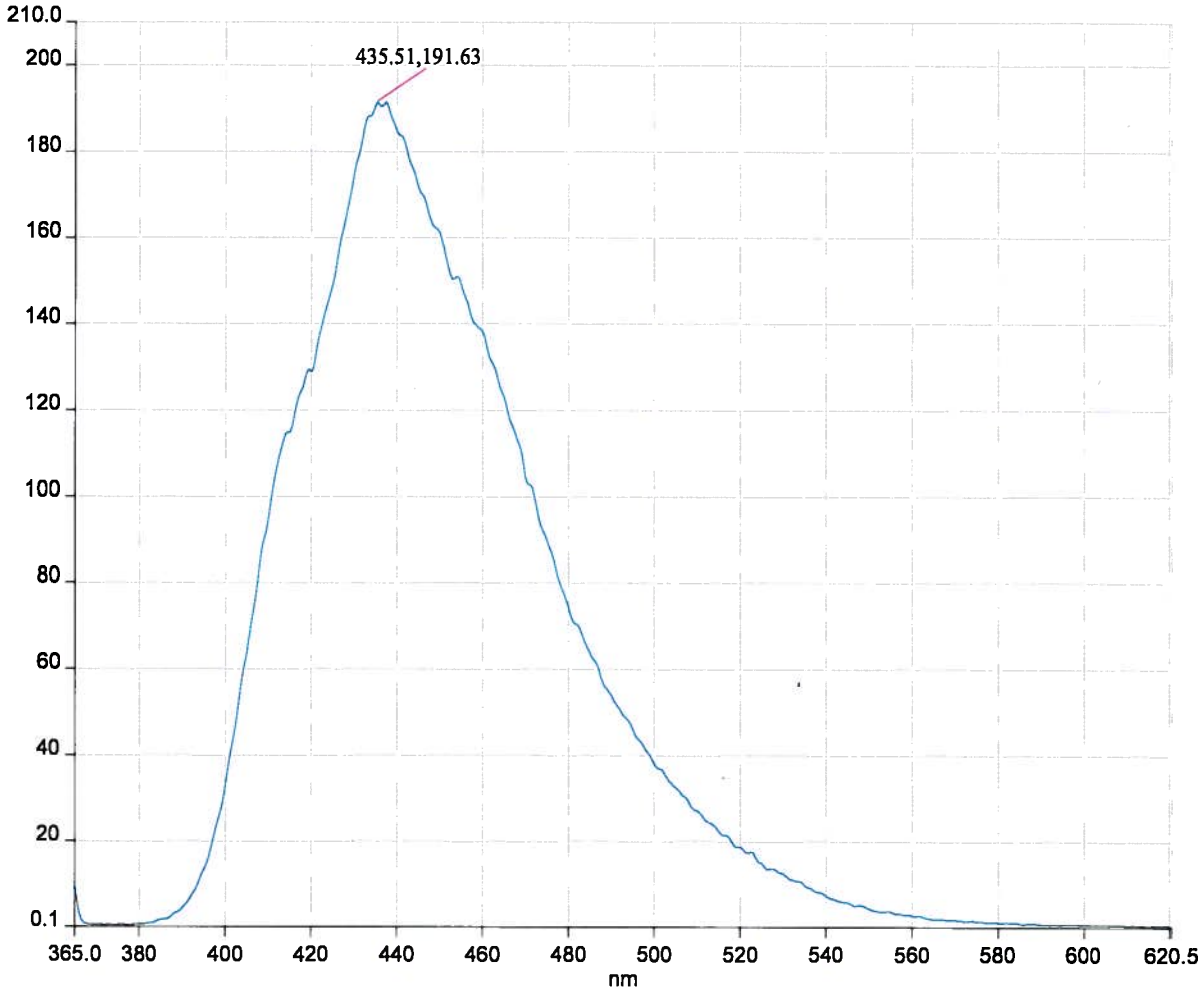

Sample 588637 D DF 2500

✓R Spris
1/15/16

JANUARY 18, 2016

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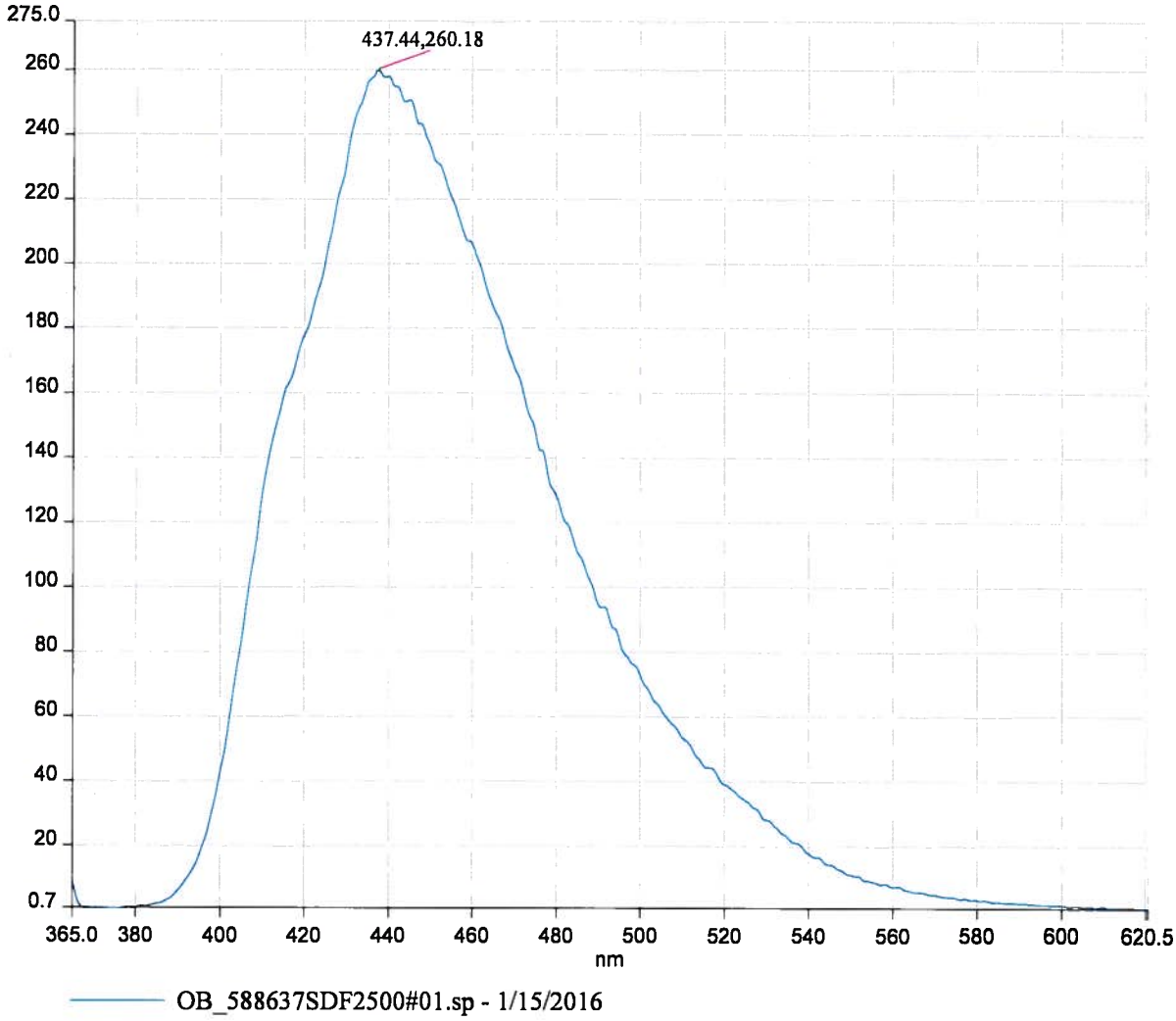
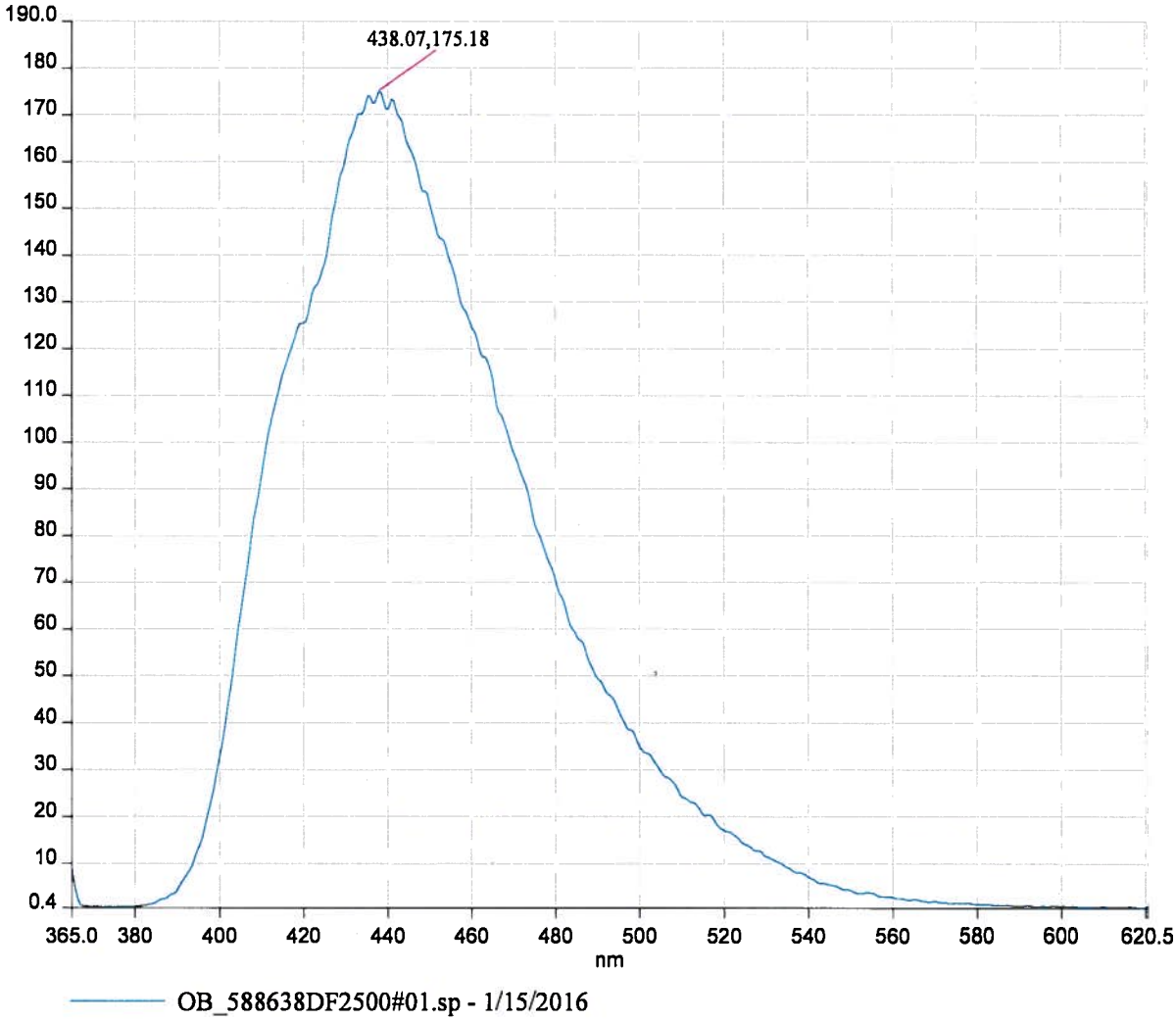


Sample 588637S DF 2500

R Spis
1/15/16

JANUARY 18, 2016

Date: 1/15/2016 Time: 12:01:49 PM



Sample 588638 DF 2500

✓ RSpin 1/15/16

JANUARY 18, 2016

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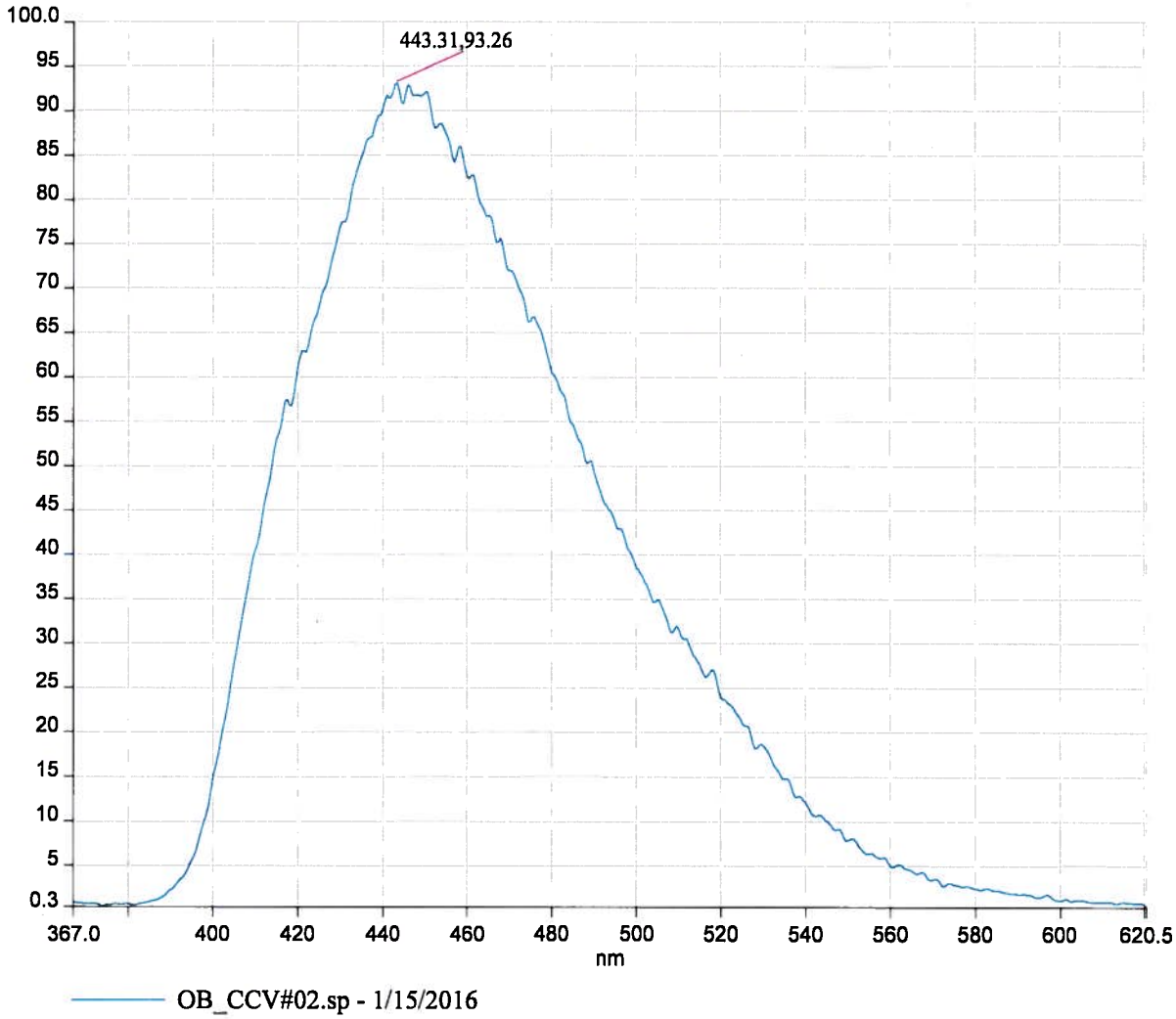

✓ RSpis 1/15/16

JANUARY 18, 2016

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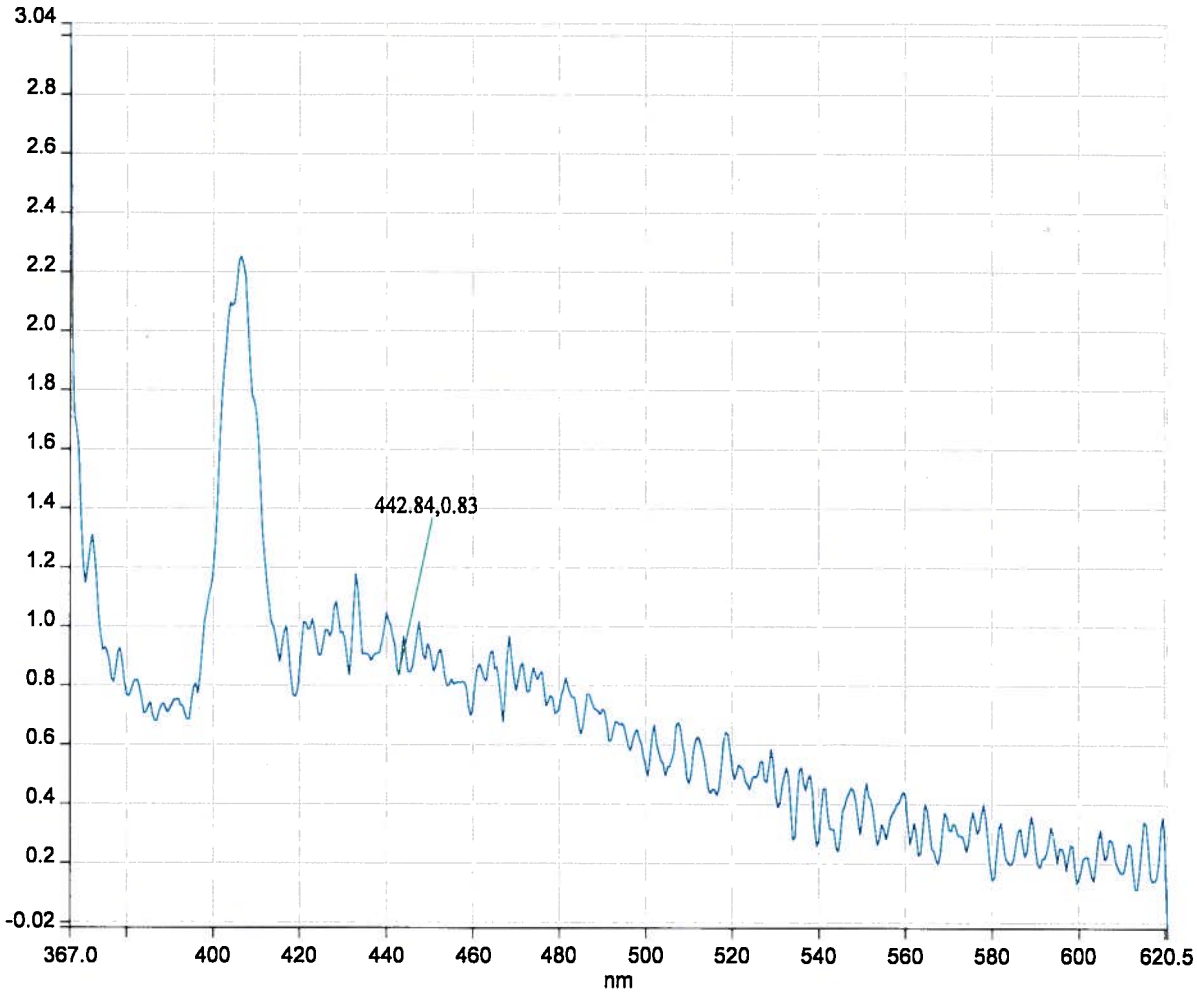

RSpin
1/15/16