TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

TestAmerica Job ID: 160-11960-1
Client Project/Site: HDP

For:
Perma-Fix Environmental Services Inc.
2800 Solway Road
Knoxville, Tennessee 37931

Attn: Brian Miller

Authorized for release by:
5/27/2015 1:11:02 PM

Ivan Vania, Project Manager II
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Job ID: 160-11960-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Perma-Fix Environmental Services Inc.

Project: HDP

Report Number: 160-11960-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 05/21/2015; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the coolers at receipt was 19.0 C.

TECHNETIUM-99 (ICPMS)

Samples L10-01-19-B-E-B-00 (160-11960-1), L10-01-20-B-E-B-00 (160-11960-2), L10-02-14-B-E-B-00 (160-11960-3), L10-02-15-B-E-B-00 (160-11960-4), L10-02-16-B-R-B-00 (160-11960-5), L10-03-15-B-E-B-00 (160-11960-6) and L10-03-16-B-E-B-00 (160-11960-7) were analyzed for Technetium-99 (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 05/21/2015 and analyzed on 05/22/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCENT SOLIDS

Samples L10-01-19-B-E-B-00 (160-11960-1), L10-01-20-B-E-B-00 (160-11960-2), L10-02-14-B-E-B-00 (160-11960-3), L10-02-15-B-E-B-00 (160-11960-4), L10-02-16-B-R-B-00 (160-11960-5), L10-03-15-B-E-B-00 (160-11960-6) and L10-03-16-B-E-B-00

Job ID: 160-11960-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

(160-11960-7) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 05/22/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TestAmerica St. Louis
13715 Rider Trail North

Earth City, MO 63045
phone 314.298.8566 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☑ Other:

Client Contact	Project Manager: Brian Miller	Site Contact: Ellen Jakub	Date: 05/21/2015	COC No: 052115-FSS1
Perma-Fix Environmental Services	Tel/Fax: (314) 810-3333	Lab Contact: Ivan Vanya	Carrier: Courier	1 of 1 COCs
2800 Solway Road	Analysis Turnaround Time			Sampler:
Knoxville, TN 37931	☐ CALENDAR DAYS ☑ WORKING DAYS			For Lab Use Only:
(865) 690-0501 Phone	TAT if different from Below 3			Walk-in Client:
(865) 539-9868 FAX	☐ 2 weeks			Lab Sampling:
Project Name: Hematite Decommissioning Project	☐ 1 week			
Site: Westinghouse Hematite, MO	☐ 2 days			Job / SDG No.:
P O # 832953	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	Gamma Spec Westinghouse Hematite Library	Alpha Spec	ICP/MS (Tc-99)	Gamma Spec (With post-21 day ingrowth)	Sample Specific Notes:
L10-01-19-B-E-B-00	5/21/15	0715	G	Soil	1	N				X	X	Matt Cushman
L10-01-20-B-E-B-00	5/21/15	0720	G	Soil	1	N				X	X	Matt Cushman
L10-02-14-B-E-B-00	5/21/15	0655	G	Soil	1	N				X	X	Matt Cushman
L10-02-15-B-E-B-00	5/21/15	0700	G	Soil	1	N				X	X	Matt Cushman
L10-02-16-B-R-B-00	5/21/15	0705	G	Soil	1	N				X	X	Matt Cushman
L10-03-15-B-E-B-00	5/21/15	0725	G	Soil	1	N				X	X	Matt Cushman
L10-03-16-B-E-B-00	5/21/15	0735	G	Soil	1	N				X	X	Matt Cushman

N / A

160-11960 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other None

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if sa

☑ Return to Client ☐ Disposal by Lab ☐ Archive for_____ Months

Special Instructions/QC Requirements & Comments: Potential for Radiological Contamination

Custody Seals Intact: ☑ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ Therm ID No.:_____

Relinquished by:	Company: Perma-Fix	Date/Time: 5-21-15/0915	Received by:	Company: CROSSROADS	Date/Time: 5-21-15 0915
Relinquished by:	Company: CROSSROADS	Date/Time: 5-21-15 1050	Received by:	Company: TA	Date/Time: 5/21/15 1050
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: Perma-Fix Environmental Services Inc.

Job Number: 160-11960-1

Login Number: 11960
List Number: 1
Creator: Daniels, Brian J

List Source: TestAmerica St. Louis

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Definitions/Glossary

Client: Perma-Fix Environmental Services Inc.
Project/Site: HDP

TestAmerica Job ID: 160-11960-1

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method Summary

Client: Perma-Fix Environmental Services Inc.
Project/Site: HDP

TestAmerica Job ID: 160-11960-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS), Tc-99	SW846	TAL SL
Moisture	Percent Moisture	EPA	TAL SL
6020A	Metals (ICP/MS), Tc-99 in Activity	SW846	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: Perma-Fix Environmental Services Inc.
Project/Site: HDP

TestAmerica Job ID: 160-11960-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-11960-1	L10-01-19-B-E-B-00	Solid	05/21/15 07:15	05/21/15 10:50
160-11960-2	L10-01-20-B-E-B-00	Solid	05/21/15 07:20	05/21/15 10:50
160-11960-3	L10-02-14-B-E-B-00	Solid	05/21/15 06:55	05/21/15 10:50
160-11960-4	L10-02-15-B-E-B-00	Solid	05/21/15 07:00	05/21/15 10:50
160-11960-5	L10-02-16-B-R-B-00	Solid	05/21/15 07:05	05/21/15 10:50
160-11960-6	L10-03-15-B-E-B-00	Solid	05/21/15 07:25	05/21/15 10:50
160-11960-7	L10-03-16-B-E-B-00	Solid	05/21/15 07:35	05/21/15 10:50

Client Sample ID: L10-01-19-B-E-B-00

Lab Sample ID: 160-11960-1
Date Collected: 05/21/15 07:15
Matrix: Solid
Date Received: 05/21/15 10:50
Percent Solids: 80.3

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000075	0.000022	mg/Kg	☼	05/21/15 17:06	05/22/15 17:38	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	**0.360**		0.169	0.172	1.50	0.256	pCi/g	05/21/15 17:06	05/22/15 17:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*84*		*30 - 110*	*05/21/15 17:06*	*05/22/15 17:38*	*1*

Client Sample ID: L10-01-20-B-E-B-00

Lab Sample ID: 160-11960-2
Date Collected: 05/21/15 07:20
Matrix: Solid
Date Received: 05/21/15 10:50
Percent Solids: 81.3

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000069	0.000021	mg/Kg	☼	05/21/15 17:06	05/22/15 17:50	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.00543	U	0.0725	0.0725	1.38	0.236	pCi/g	05/21/15 17:06	05/22/15 17:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*90*		*30 - 110*	*05/21/15 17:06*	*05/22/15 17:50*	*1*

Client Sample ID: L10-02-14-B-E-B-00

Lab Sample ID: 160-11960-3
Date Collected: 05/21/15 06:55
Matrix: Solid
Date Received: 05/21/15 10:50
Percent Solids: 80.8

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000071	0.000021	mg/Kg	☼	05/21/15 17:06	05/22/15 17:54	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-0.00317	U	0.0159	0.0159	1.42	0.244	pCi/g	05/21/15 17:06	05/22/15 17:54	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*88*		*30 - 110*	*05/21/15 17:06*	*05/22/15 17:54*	*1*

Client Sample ID: L10-02-15-B-E-B-00 — Lab Sample ID: 160-11960-4

Date Collected: 05/21/15 07:00 — **Matrix: Solid**
Date Received: 05/21/15 10:50 — **Percent Solids: 83.3**

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000069	0.000021	mg/Kg	☼	05/21/15 17:06	05/22/15 17:58	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-0.00901	U	0.0490	0.0490	1.39	0.237	pCi/g	05/21/15 17:06	05/22/15 17:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*87*		*30 - 110*	*05/21/15 17:06*	*05/22/15 17:58*	*1*

Client Sample ID: L10-02-16-B-R-B-00 — Lab Sample ID: 160-11960-5

Date Collected: 05/21/15 07:05 — **Matrix: Solid**
Date Received: 05/21/15 10:50 — **Percent Solids: 79.5**

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000072	0.000022	mg/Kg	☼	05/21/15 17:06	05/22/15 18:01	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-0.0191	U	0.0373	0.0373	1.45	0.248	pCi/g	05/21/15 17:06	05/22/15 18:01	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*87*		*30 - 110*	*05/21/15 17:06*	*05/22/15 18:01*	*1*

Client Sample ID: L10-03-15-B-E-B-00 — Lab Sample ID: 160-11960-6

Date Collected: 05/21/15 07:25 — **Matrix: Solid**
Date Received: 05/21/15 10:50 — **Percent Solids: 73.2**

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000080	0.000024	mg/Kg	☼	05/21/15 17:06	05/22/15 18:05	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-0.0295	U	0.0447	0.0448	1.59	0.273	pCi/g	05/21/15 17:06	05/22/15 18:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*86*		*30 - 110*	*05/21/15 17:06*	*05/22/15 18:05*	*1*

Client Sample ID: L10-03-16-B-E-B-00 — Lab Sample ID: 160-11960-7

Date Collected: 05/21/15 07:35 — **Matrix: Solid**
Date Received: 05/21/15 10:50 — **Percent Solids: 75.2**

Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000077	0.000023	mg/Kg	☼	05/21/15 17:06	05/22/15 18:21	1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.0156	U	0.0288	0.0288	1.55	0.265	pCi/g	05/21/15 17:06	05/22/15 18:21	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*86*		*30 - 110*	*05/21/15 17:06*	*05/22/15 18:21*	*1*

Method: 6020A - Metals (ICP/MS), Tc-99

Lab Sample ID: MB 160-191891/1-A
Matrix: Solid
Analysis Batch: 192164

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 191891

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000055	0.000017	mg/Kg		05/21/15 17:06	05/22/15 17:30	1

Lab Sample ID: LCS 160-191891/2-A
Matrix: Solid
Analysis Batch: 192164

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 191891

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	0.00123	0.00123		mg/Kg		100	80 - 120

Lab Sample ID: 160-11960-1 MS
Matrix: Solid
Analysis Batch: 192164

Client Sample ID: L10-01-19-B-E-B-00
Prep Type: Total/NA
Prep Batch: 191891

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	ND		0.00153	0.00154		mg/Kg	☼	101	75 - 125

Lab Sample ID: 160-11960-1 MSD
Matrix: Solid
Analysis Batch: 192164

Client Sample ID: L10-01-19-B-E-B-00
Prep Type: Total/NA
Prep Batch: 191891

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Technetium 99	ND		0.00153	0.00154		mg/Kg	☼	101	75 - 125	0	30

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Lab Sample ID: MB 160-191891/1-A
Matrix: Solid
Analysis Batch: 192165

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 191891

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.01699	U	0.0304	0.0304	1.10	0.189	pCi/g	05/21/15 17:06	05/22/15 17:30	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Re	*91*		*30 - 110*	*05/21/15 17:06*	*05/22/15 17:30*	*1*

Lab Sample ID: LCS 160-191891/2-A
Matrix: Solid
Analysis Batch: 192165

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 191891

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	21.0	21.00		2.28	1.13	0.194	pCi/g	100	80 - 120

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Re	*88*		*30 - 110*

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity (Continued)

Lab Sample ID: 160-11960-1 MS
Matrix: Solid
Analysis Batch: 192165

Client Sample ID: L10-01-19-B-E-B-00
Prep Type: Total/NA
Prep Batch: 191891

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	0.360		26.3	26.45		2.64	1.43	0.245	pCi/g	99	75 - 125

Carrier	*MS %Yield*	*MS Qualifier*	*Limits*
Re	*87*		*30 - 110*

Lab Sample ID: 160-11960-1 MSD
Matrix: Solid
Analysis Batch: 192165

Client Sample ID: L10-01-19-B-E-B-00
Prep Type: Total/NA
Prep Batch: 191891

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Technetium 99	0.360		26.2	26.36		2.49	1.43	0.245	pCi/g	99	75 - 125	0.02	1

Carrier	*MSD %Yield*	*MSD Qualifier*	*Limits*
Re	*87*		*30 - 110*

QC Association Summary

Client: Perma-Fix Environmental Services Inc.
Project/Site: HDP

TestAmerica Job ID: 160-11960-1

Metals

Prep Batch: 191891

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-11960-1	L10-01-19-B-E-B-00	Total/NA	Solid	None	
160-11960-1 MS	L10-01-19-B-E-B-00	Total/NA	Solid	None	
160-11960-1 MSD	L10-01-19-B-E-B-00	Total/NA	Solid	None	
160-11960-2	L10-01-20-B-E-B-00	Total/NA	Solid	None	
160-11960-3	L10-02-14-B-E-B-00	Total/NA	Solid	None	
160-11960-4	L10-02-15-B-E-B-00	Total/NA	Solid	None	
160-11960-5	L10-02-16-B-R-B-00	Total/NA	Solid	None	
160-11960-6	L10-03-15-B-E-B-00	Total/NA	Solid	None	
160-11960-7	L10-03-16-B-E-B-00	Total/NA	Solid	None	
LCS 160-191891/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-191891/1-A	Method Blank	Total/NA	Solid	None	

Analysis Batch: 192164

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-11960-1	L10-01-19-B-E-B-00	Total/NA	Solid	6020A	191891
160-11960-1 MS	L10-01-19-B-E-B-00	Total/NA	Solid	6020A	191891
160-11960-1 MSD	L10-01-19-B-E-B-00	Total/NA	Solid	6020A	191891
160-11960-2	L10-01-20-B-E-B-00	Total/NA	Solid	6020A	191891
160-11960-3	L10-02-14-B-E-B-00	Total/NA	Solid	6020A	191891
160-11960-4	L10-02-15-B-E-B-00	Total/NA	Solid	6020A	191891
160-11960-5	L10-02-16-B-R-B-00	Total/NA	Solid	6020A	191891
160-11960-6	L10-03-15-B-E-B-00	Total/NA	Solid	6020A	191891
160-11960-7	L10-03-16-B-E-B-00	Total/NA	Solid	6020A	191891
LCS 160-191891/2-A	Lab Control Sample	Total/NA	Solid	6020A	191891
MB 160-191891/1-A	Method Blank	Total/NA	Solid	6020A	191891

General Chemistry

Analysis Batch: 191920

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-11960-1	L10-01-19-B-E-B-00	Total/NA	Solid	Moisture	
160-11960-2	L10-01-20-B-E-B-00	Total/NA	Solid	Moisture	
160-11960-3	L10-02-14-B-E-B-00	Total/NA	Solid	Moisture	
160-11960-4	L10-02-15-B-E-B-00	Total/NA	Solid	Moisture	
160-11960-5	L10-02-16-B-R-B-00	Total/NA	Solid	Moisture	
160-11960-6	L10-03-15-B-E-B-00	Total/NA	Solid	Moisture	
160-11960-7	L10-03-16-B-E-B-00	Total/NA	Solid	Moisture	
160-11960-7 DU	L10-03-16-B-E-B-00	Total/NA	Solid	Moisture	

Rad

Prep Batch: 191891

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-11960-1	L10-01-19-B-E-B-00	Total/NA	Solid	None	
160-11960-1 MS	L10-01-19-B-E-B-00	Total/NA	Solid	None	
160-11960-1 MSD	L10-01-19-B-E-B-00	Total/NA	Solid	None	
160-11960-2	L10-01-20-B-E-B-00	Total/NA	Solid	None	
160-11960-3	L10-02-14-B-E-B-00	Total/NA	Solid	None	
160-11960-4	L10-02-15-B-E-B-00	Total/NA	Solid	None	
160-11960-5	L10-02-16-B-R-B-00	Total/NA	Solid	None	

Rad (Continued)

Prep Batch: 191891 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-11960-6	L10-03-15-B-E-B-00	Total/NA	Solid	None	
160-11960-7	L10-03-16-B-E-B-00	Total/NA	Solid	None	
LCS 160-191891/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-191891/1-A	Method Blank	Total/NA	Solid	None	

Tracer/Carrier Summary

Client: Perma-Fix Environmental Services Inc.
Project/Site: HDP

TestAmerica Job ID: 160-11960-1

Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Matrix: Solid

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)							
Lab Sample ID	Client Sample ID	Re (30-110)							
160-11960-1	L10-01-19-B-E-B-00	84							
160-11960-1 MS	L10-01-19-B-E-B-00	87							
160-11960-1 MSD	L10-01-19-B-E-B-00	87							
160-11960-2	L10-01-20-B-E-B-00	90							
160-11960-3	L10-02-14-B-E-B-00	88							
160-11960-4	L10-02-15-B-E-B-00	87							
160-11960-5	L10-02-16-B-R-B-00	87							
160-11960-6	L10-03-15-B-E-B-00	86							
160-11960-7	L10-03-16-B-E-B-00	86							
LCS 160-191891/2-A	Lab Control Sample	88							
MB 160-191891/1-A	Method Blank	91							

Tracer/Carrier Legend

Re = Re