



August 9, 2014

Bruce Wanstall, Project Manager
State of Alaska, Alaska Department of Environmental Conservation
Division of Spill Prevention and Response, Contaminated Sites Program
410 Willoughby Ave, Suite 303
PO Box 111800
Juneau, AK 99801

CC: Larry Beck, Chilkoot Lumber Company

Re: Chilkoot Lumber Company. Characterization for two stockpiles: ADEC File 1508.38.009

Mr. Bruce Wanstall,

This memo introduces attached laboratory results from two stockpiles staged during the summer of 2009 at Chilkoot Lumber Company in Haines. The characterization workplan was approved by ADEC 6.16.14. This memo, laboratory report and data quality review checklist supplement the 6.20.14 fieldwork memo.

	DRO	RRO
N1	470 x	1500
N2	480 x	780
N3	760	92
S2	1200	1300
S3	760	1100

DRO and RRO results from FB Laboratory Report 406386. VOC results were below detection or far below any relevant cleanup standards

X = the sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Signature of Qualified Environmental Professional:

Elijah Donat MS PMP prepared this 1-page memo, checklist and attached the Friedman and Bruya Laboratory Report 406386.

Elijah Donat, Principal Investigator
August 9, 2014

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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July 8, 2014

Elijah Donat, Project Manager
Chilkat Environmental
PO Box 865
Haines, AK 99827

Dear Mr. Donat:

Included are the results from the testing of material submitted on June 21, 2014 from the CLC Stockpiles, F&BI 406386 project. There are 14 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
CHL0708R.DOC

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 21, 2013 by Friedman & Bruya, Inc. (ADEC laboratory approval number UST-007) from the Chilkat Environmental CLC Stockpiles, F&BI 406386 project. The samples were received at 4°C in good condition and were refrigerated upon receipt. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Chilkat Environmental</u>	<u>Date Sampled</u>	<u>Percent Moisture</u>
406386 -01	N1	06/18/14	20
406386 -02	N2	06/18/14	10
406386 -03	N3	06/18/14	8
406386 -04	S2	06/19/14	9
406386 -05	S3	06/19/14	4

The samples were analyzed as follows.

DRO/RRO (soil) - Analysis Method AK 102/AK 103, Extraction Method 3550B
All quality control requirements were acceptable.

VOCs (soil) - Analysis Method 8260B, Extraction Method 5035
Methylene chloride was detected in the 8260C analysis of sample N1. The data were flagged as due to laboratory contamination. All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/08/14
Date Received: 06/21/14
Project: CLC Stockpiles, F&BI 406386
Date Extracted: 06/27/14
Date Analyzed: 07/03/14

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL
USING METHOD AK 102**

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Surrogate</u> (% Recovery) (Limit 50-150)
N1 406386-01	470 x	101
N2 406386-02	480 x	87
N3 406386-03	760	86
S2 406386-04	1,200	86
S3 406386-05	760	92
Method Blank 04-1337 MB	<5	97

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/08/14
Date Received: 06/21/14
Project: CLC Stockpiles, F&BI 406386
Date Extracted: 06/27/14
Date Analyzed: 07/03/14

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
USING METHOD AK 103**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> (% Recovery) (Limit 50-150)
N1 406386-01	1,500	126
N2 406386-02	780	134
N3 406386-03	92	121
S2 406386-04	1,300	150
S3 406386-05	1,100	123
Method Blank 04-1337 MB	<50	87

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	N1	Client:	Chilkat Environmental
Date Received:	06/21/14	Project:	CLC Stockpiles, F&BI 406386
Date Extracted:	06/24/14	Lab ID:	406386-01
Date Analyzed:	06/25/14	Data File:	062517.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	62	142
Toluene-d8	103	51	121
4-Bromofluorobenzene	89	32	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	0.79 lc	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.02	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	0.12	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	N2	Client:	Chilkat Environmental
Date Received:	06/21/14	Project:	CLC Stockpiles, F&BI 406386
Date Extracted:	06/24/14	Lab ID:	406386-02
Date Analyzed:	06/25/14	Data File:	062518.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	62	142
Toluene-d8	104	51	121
4-Bromofluorobenzene	98	32	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.02	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID: N3	Client: Chilkat Environmental
Date Received: 06/21/14	Project: CLC Stockpiles, F&BI 406386
Date Extracted: 06/24/14	Lab ID: 406386-03
Date Analyzed: 06/25/14	Data File: 062519.D
Matrix: Soil	Instrument: GCMS4
Units: mg/kg (ppm) Dry Weight	Operator: JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	62	142
Toluene-d8	102	51	121
4-Bromofluorobenzene	101	32	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.02	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzen e	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	S2	Client:	Chilkat Environmental
Date Received:	06/21/14	Project:	CLC Stockpiles, F&BI 406386
Date Extracted:	06/24/14	Lab ID:	406386-04
Date Analyzed:	06/25/14	Data File:	062520.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	62	142
Toluene-d8	103	51	121
4-Bromofluorobenzene	94	32	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	0.025	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID: S3	Client: Chilkat Environmental
Date Received: 06/21/14	Project: CLC Stockpiles, F&BI 406386
Date Extracted: 06/24/14	Lab ID: 406386-05
Date Analyzed: 06/25/14	Data File: 062521.D
Matrix: Soil	Instrument: GCMS4
Units: mg/kg (ppm) Dry Weight	Operator: JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	62	142
Toluene-d8	103	51	121
4-Bromofluorobenzene	99	32	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.02	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Chilkat Environmental
Date Received:	Not Applicable	Project:	CLC Stockpiles, F&BI 406386
Date Extracted:	06/24/14	Lab ID:	04-1276 mb
Date Analyzed:	06/24/14	Data File:	062409.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	62	142
Toluene-d8	101	51	121
4-Bromofluorobenzene	97	32	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.02	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/08/14

Date Received: 06/21/14

Project: CLC Stockpiles, F&BI 406386

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL
USING METHOD AK 102**

Laboratory Code: 406386-02 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Diesel	mg/kg (ppm)	430	430	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel	mg/kg (ppm)	500	92	90	75-125	2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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Project: CLC Stockpiles, F&BI 406386

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
USING METHOD AK 103**

Laboratory Code: 406386-02 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Motor Oil	mg/kg (ppm)	700	690	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Motor Oil	mg/kg (ppm)	500	72	76	60-120	5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/08/14

Date Received: 06/21/14

Project: CLC Stockpiles, F&BI 406386

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES
FOR VOLATILES BY EPA METHOD 8260C**

Laboratory Code: 406245-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	14	12	10-142	15
Chloromethane	mg/kg (ppm)	2.5	<0.5	41	39	10-126	5
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	44	41	10-138	7
Bromomethane	mg/kg (ppm)	2.5	<0.5	67	67	10-163	0
Chloroethane	mg/kg (ppm)	2.5	<0.5	63	63	10-176	0
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	51	49	10-176	4
Acetone	mg/kg (ppm)	12.5	<0.5	90	84	10-163	7
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	67	64	10-160	5
Methylene chloride	mg/kg (ppm)	2.5	<0.5	75	71	10-156	5
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	90	84	21-145	7
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	77	74	14-137	4
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	84	80	19-140	5
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	95	91	10-158	4
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	85	82	25-135	4
Chloroform	mg/kg (ppm)	2.5	<0.05	86	82	21-145	5
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	90	83	19-147	8
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	84	80	12-160	5
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	83	80	10-156	4
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	77	74	17-140	4
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	74	70	9-164	6
Benzene	mg/kg (ppm)	2.5	<0.03	78	74	29-129	5
Trichloroethene	mg/kg (ppm)	2.5	<0.02	80	76	21-139	5
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	90	85	30-135	6
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	86	80	23-155	7
Dibromomethane	mg/kg (ppm)	2.5	<0.05	86	80	23-145	7
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	94	94	24-155	4
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	90	84	28-144	7
Toluene	mg/kg (ppm)	2.5	<0.05	76	73	35-130	4
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	91	86	26-149	6
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	89	86	10-205	3
2-Hexanone	mg/kg (ppm)	12.5	<0.5	96	91	15-166	5
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	86	82	31-137	5
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	69	67	20-133	3
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	85	80	28-150	6
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	89	85	28-142	5
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	80	77	32-129	4
Ethylbenzene	mg/kg (ppm)	2.5	<0.05	75	72	32-137	4
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	90	87	31-143	3
m,p-Xylene	mg/kg (ppm)	5	<0.1	77	73	34-136	5
o-Xylene	mg/kg (ppm)	2.5	<0.05	82	79	33-134	4
Styrene	mg/kg (ppm)	2.5	<0.05	86	83	35-137	4
Isopropylbenzene	mg/kg (ppm)	2.5	<0.05	76	74	31-142	3
Bromoform	mg/kg (ppm)	2.5	<0.05	87	81	21-156	7
n-Propylbenzene	mg/kg (ppm)	2.5	<0.05	70	67	23-146	4
Bromobenzene	mg/kg (ppm)	2.5	<0.05	83	79	34-130	5
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	0.093	69	67	18-149	3
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	99	93	28-140	6
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	85	80	25-144	6
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	73	68	31-134	7
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	73	70	31-136	4
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	75	72	30-137	4
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	68	66	10-182	3
sec-Butylbenzene	mg/kg (ppm)	2.5	<0.05	72	69	23-145	4
p-Isopropyltoluene	mg/kg (ppm)	2.5	<0.05	69	66	21-149	4
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	75	72	30-131	4
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	74	70	29-129	6
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	77	73	31-132	5
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	83	77	11-161	7
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	69	65	22-142	6
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	73	70	10-142	4
Naphthalene	mg/kg (ppm)	2.5	<0.05	78	74	14-157	5
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	72	68	20-144	6

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/08/14

Date Received: 06/21/14

Project: CLC Stockpiles, F&BI 406386

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES
FOR VOLATILES BY EPA METHOD 8260C**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	Acceptance
			Recovery LCS	Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	40	10-146
Chloromethane	mg/kg (ppm)	2.5	64	27-133
Vinyl chloride	mg/kg (ppm)	2.5	74	22-139
Bromomethane	mg/kg (ppm)	2.5	79	38-114
Chloroethane	mg/kg (ppm)	2.5	80	10-163
Trichlorofluoromethane	mg/kg (ppm)	2.5	81	10-196
Acetone	mg/kg (ppm)	12.5	103	52-141
1,1-Dichloroethene	mg/kg (ppm)	2.5	93	47-128
Methylene chloride	mg/kg (ppm)	2.5	89	42-132
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	103	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	97	67-127
1,1-Dichloroethane	mg/kg (ppm)	2.5	101	68-115
2,2-Dichloropropane	mg/kg (ppm)	2.5	116	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	100	72-113
Chloroform	mg/kg (ppm)	2.5	100	66-120
2-Butanone (MEK)	mg/kg (ppm)	12.5	100	57-123
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	100	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	106	62-131
1,1-Dichloropropene	mg/kg (ppm)	2.5	100	69-128
Carbon tetrachloride	mg/kg (ppm)	2.5	98	60-139
Benzene	mg/kg (ppm)	2.5	95	68-114
Trichloroethene	mg/kg (ppm)	2.5	98	64-117
1,2-Dichloropropane	mg/kg (ppm)	2.5	109	72-127
Bromodichloromethane	mg/kg (ppm)	2.5	102	72-130
Dibromomethane	mg/kg (ppm)	2.5	100	70-120
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	108	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	107	75-136
Toluene	mg/kg (ppm)	2.5	94	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	108	72-132
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	103	75-113
2-Hexanone	mg/kg (ppm)	12.5	106	33-152
1,3-Dichloropropane	mg/kg (ppm)	2.5	102	72-130
Tetrachloroethene	mg/kg (ppm)	2.5	97	72-114
Dibromochloromethane	mg/kg (ppm)	2.5	102	74-125
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	109	74-132
Chlorobenzene	mg/kg (ppm)	2.5	98	76-111
Ethylbenzene	mg/kg (ppm)	2.5	98	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	106	69-135
m,p-Xylene	mg/kg (ppm)	5	99	78-122
o-Xylene	mg/kg (ppm)	2.5	104	77-124
Styrene	mg/kg (ppm)	2.5	105	74-126
Isopropylbenzene	mg/kg (ppm)	2.5	99	76-127
Bromoform	mg/kg (ppm)	2.5	103	56-132
n-Propylbenzene	mg/kg (ppm)	2.5	95	74-124
Bromobenzene	mg/kg (ppm)	2.5	103	72-122
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	99	76-126
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	106	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	97	61-137
2-Chlorotoluene	mg/kg (ppm)	2.5	95	74-121
4-Chlorotoluene	mg/kg (ppm)	2.5	94	75-122
tert-Butylbenzene	mg/kg (ppm)	2.5	103	73-130
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	96	76-125
sec-Butylbenzene	mg/kg (ppm)	2.5	100	71-130
p-Isopropyltoluene	mg/kg (ppm)	2.5	100	70-132
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	97	75-121
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	95	74-117
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	95	76-121
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	100	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	96	64-135
Hexachlorobutadiene	mg/kg (ppm)	2.5	99	50-153
Naphthalene	mg/kg (ppm)	2.5	98	63-140
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	97	63-138

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

406386

SAMPLE CHAIN OF CUSTODY

ME 06/21/14

02 / CI 2

Send Report To Eligh Dant

Company Chillat Environmental

Address PO Box 865

City, State, ZIP Haines, AK 99827

Phone # 907 303 7899 Fax # _____

SAMPLERS (signature) [Signature]

PROJECT NAME/NO. CLC stockpiles

PO#

REMARKS

SAMPLERS (signature)		PROJECT NAME/NO.	PO#
CLC stockpiles			
REMARKS			

Page # _____ of _____

TURNAROUND TIME
 Standard (2 Weeks)
 RUSH
 Rush charges authorized by _____

SAMPLE DISPOSAL
 Dispose after 30 days
 Return samples
 Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED						Notes		
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS		DRO	RRO
N1	01 AB	6/19/14	1030	Soil	2				X			X	X	
N2	02	6/19/14	1312		2				X			X	X	
N3	03	6/18/14	1642		2				X			X	X	
N4	04	6/19/14	1842		2				X			X	X	
S2	04	6/19/14	1200		2				X			X	X	
S3	05	6/19/14	1530		2				X			X	X	

Friedman & Bryga, Inc.
 3012 16th Avenue West
 Seattle, WA 98119-2029
 Ph. (206) 285-8282
 Fax (206) 283-5044
 FORMS/COC/COC.DOC

Relinquished by: <u>[Signature]</u>	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>Eligh Dant</u>		Eligh Dant	Chillat Environmental	6/29/14	1035
Received by: <u>[Signature]</u>		Fred Bryga	FFB	6/21/14	
Received by:					
Received by:					

Samples received at 4 °C

Laboratory Data Review Checklist

Completed by:	Elijah Donat		
Title:	Principal Investigator	Date:	8.9.14
CS Report Name:	CLC Stockpiles	Report Date:	7.8.14
Consultant Firm:	Chilkat Environmental		
Laboratory Name:	Friedman and Bruya	Laboratory Report Number:	406386
ADEC File Number:	1508.38.009	ADEC RecKey Number:	

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

Yes No NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

Yes No NA (Please explain.) Comments:

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

Yes No NA (Please explain.) Comments:

b. Correct analyses requested?

Yes No NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt ($4^{\circ} \pm 2^{\circ}$ C)?

Yes No NA (Please explain.) Comments:

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

Yes No NA (Please explain) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

Yes No NA (Please explain) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

Yes No NA (Please explain) Comments:

e. Data quality or usability affected? (Please explain)

Comments:

4. Case Narrative

a. Present and understandable?

Yes No NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

Yes No NA (Please explain) Comments:

c. Were all corrective actions documented?

Yes No NA (Please explain) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes No NA (Please explain) Comments:

b. All applicable holding times met?

Yes No NA (Please explain) Comments:

c. All soils reported on a dry weight basis?

Yes No NA (Please explain) Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

Yes No NA (Please explain) Comments:

e. Data quality or usability affected? (Please explain)

Comments:

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes No NA (Please explain) Comments:

ii. All method blank results less than PQL?

Yes No NA (Please explain) Comments:

iii. If above PQL, what samples are affected?

Comments:

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes No NA (Please explain) Comments:

v. Data quality or usability affected? (Please explain) Comments:

No. Methylene chloride contamination in Sample N1 was due to lab contamination.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes No NA (Please explain) Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes No NA (Please explain) Comments:

iii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes No NA (Please explain) Comments:

all recoveries within acceptance criteria

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes No NA (Please explain) Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

none

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

Yes No NA (Please explain) Comments:

none effected

vii. Data quality or usability affected? (Please explain)

Comments:

no

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

Yes No NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes No NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

Yes No NA (Please explain) Comments:

no failed recoveries

iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

no

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes No NA (Please explain.) Comments:

no trip blank

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes No NA (Please explain.) Comments:

iii. All results less than PQL?

Yes No NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes No NA (Please explain.) Comments:

ii. Submitted blind to lab?

Yes No NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs?
(Recommended: 30% water, 50% soil)

$$RPD (\%) = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Yes No NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Yes No NA (Please explain.) Comments:

f. Decontamination or Equipment Blank (if applicable)

Yes No NA (Please explain)

Comments:

i. All results less than PQL?

Yes No NA (Please explain)

Comments:

ii. If above PQL, what samples are affected?

Comments:

iii. Data quality or usability affected? (Please explain.)

Comments:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes No NA (Please explain)

Comments: