H0347-TMA/RECRA

RECRA LabNet

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MAR 1999 RECEIVED Data Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD C99-020
RFW# : 9902L272
SDG# : H0347
SAF# : C99-020

W.O. # : 10985-001-001-9999-00
Date Received: 02-26-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 4 water samples.

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary. For NPDES samples: Ammonia distillations for method 350.3 were not performed as specified in 40 CFR part 136.

3. Sample holding times as required by the method and/or contract were met.

4. The cooler temperature was recorded on the chain-of-custody.

5. The method blanks were within method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recovery for Ammonia was within the 75-125% control limits.

8. The replicate analyses were within the 20% RPD control limit.

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

3-17-99
Date

njp\i02-272

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

01

WET CHEMISTRY METHODS GLOSSARY FOR ANALYSIS OF WATER SAMPLES

	EPA 600	SW846	OTHER
Acidity	__305.1		
__Alkalinity __Bicarbonate __Carbonate	__310.1		
BOD	__405.1		__5210B (b)
Ion Chromatography:			
__Bromide __Chloride __Fluoride	__300.0	__9056	
__Nitrite __Nitrate __Phosphate	__300.0	__9056	
__Sulfate __Formate __Acetate __Oxalate	__300.0	__9056	
Chloride	__325.2	__9251	
Chlorine Residual	__330.5 (mod)		
Cyanide Amenable to Chlorination	__335.2	__9010A	
Cyanide (Total)	__335.2	__9010A __9012	__ILM04.0 (e)
Cyanide, Weak Acid Dissociable			__412 (a) __4500CN-I (b)
COD	__410.4 (mod)		__5220 C (b)
Color	__110.2		
Corrosivity (by Coupon)		__1110 (mod)	
Chromium VI		__7196A	__3500Cr-D (b)
Fluoride	__340.2		
Hardness, Calcium	__215.2		
Hardness, Total	__130.2		
Iodide			__ASTM D19P202 (1)
Surfactant	__425.1		
__Nitrate-Nitrite __Nitrate __Nitrite	__353.2		
Ammonia	✓350.3		
Total __Kjeldahl Nitrogen __Organic Nitrogen	__351.4		
Total __Organic __Inorganic Carbon	__415.1	__9060	
Oil and Grease	✓413.1	__9070	
__pH __pH, Paper	__150.1	__9040A __9041A	
Petroleum Hydrocarbons, Total Recoverable	__418.1		
Phenol	__420.1 __420.2	__9065 __9066	
__Ortho Phosphate __Total Phosphate	__365.2		__4500-P B __C
Salinity			__210A (a) __2520B (b)
Settleable Solids	__160.5		
Sulfide	__376.2 __376.1	__9030A	
Reactive __Cyanide __Sulfide		__Sec 7.3	
Silica	__370.1		
Sulfite	__377.1		
Sulfate	__375.4	__9038	
Specific Conductance	__120.1	__9050	
Specific Gravity			__213E (a)
__TCLP __TCLV		__1311	
Synthetic Precipitation Leach		__1312	
Total __Dissolved __Suspended __Solids	160__.1__.2__.3		
Total Organic Halides	__450.1	__9020B	
Turbidity	__180.1		
Volatile Solids __Total __Dissolved __Suspended	__160.4		

Other:_____ Method:_____

02

RFW 21-21-034/A-08/95

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed., (1989).

b. Standard Methods for the Examination of Water and Waste, 17 ed., (1983)

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd. Ed. (1986)

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965)

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

RFW 21-21L-034/D-06/96

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 03/16/99

CLIENT: TNU-HANFORD C99-020 RECRA LOT #: 9902L272

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0TM52	Oil & Grease Gravimetri	1.1	MG/L	1.1	1.0
-002	B0TM53	Oil & Grease Gravimetri	1.1	MG/L	1.1	1.0
-003	B0TM89	Oil & Grease Gravimetri	1.4	MG/L	1.1	1.0
-004	B0TP29	Ammonia, as N	0.10 u	MG/L	0.10	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/16/99

CLIENT: TNU-HANFORD C99-020 RECRA LOT #: 9902L272

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LOG007-MB1	Oil & Grease Gravimetri	1.0 u	MG/L	1.0	1.0
BLANK10	99LAMA10-MB1	Ammonia, as N	0.10 u	MG/L	0.10	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 03/16/99

CLIENT: TNU-HANFORD C99-020

RECRA LOT #: 9902L272

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-004	B0TP29	Ammonia, as N	0.96	0.10u	1.0	95.6	1.0
BLANK10	99LOG007-MB1	Oil & Grease Gravimetr	32.5	1.0 u	32.6	99.7	1.0
		Oil & Grease - Grav M	32.8	1.0 u	34.7	94.6	1.0
BLANK10	99LAMA10-MB1	Ammonia, as N	0.99	0.10u	1.0	99.3	1.0
		Ammonia, as N MSD	0.94	0.10u	1.0	94.1	1.0

Recra LabNet - Lionville

INORGANICS DUPLICATE SPIKE REPORT 03/16/99

CLIENT: TNU-HANFORD C99-020 RECRA LOT #: 9902L272

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	99LOG007-MB1	Oil & Grease - Grav	99.7	94.6	5.2
BLANK10	99LAMA10-MB1	Ammonia, as N	99.3	94.1	5.4

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 03/16/99

CLIENT: TNU-HANFORD C99-020 RECRA LOT #: 9902L272

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0TM52	Oil & Grease Gravimetri	1.1	1.1 u	NC	1.0
-004REP	B0TP29	Ammonia, as N	0.10u	0.10u	NC	1.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD C99-020

DATE RECEIVED: 02/26/99 RFW LOT # :9902L272

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0TM52						
OIL & GREASE BY GRAV	001	W	99LOG007	02/24/99	03/09/99	03/09/99
OIL AND GREASE BY GR	001 REP	W	99LOG007	02/24/99	03/09/99	03/09/99
B0TM53						
OIL & GREASE BY GRAV	002	W	99LOG007	02/24/99	03/09/99	03/09/99
B0TM89						
OIL & GREASE BY GRAV	003	W	99LOG007	02/24/99	03/09/99	03/09/99
B0TP29						
AMMONIA	004	W	99LAMA10	02/24/99	03/04/99	03/04/99
AMMONIA	004 REP	W	99LAMA10	02/24/99	03/04/99	03/04/99
AMMONIA	004 MS	W	99LAMA10	02/24/99	03/04/99	03/04/99

LAB QC:

OIL & GREASE BY GRAV	MB1	W	99LOG007	N/A	03/09/99	03/09/99
OIL AND GREASE BY GR	MB1 BS	W	99LOG007	N/A	03/09/99	03/09/99
OIL AND GREASE BY GR	MB1 BSD	W	99LOG007	N/A	03/09/99	03/09/99
AMMONIA	MB1	W	99LAMA10	N/A	03/04/99	03/04/99
AMMONIA	MB1 BS	W	99LAMA10	N/A	03/04/99	03/04/99
AMMONIA	MB1 BSD	W	99LAMA10	N/A	03/04/99	03/04/99

RECRA LabNet Use Only

99026272

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-Hanford C99-020

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: Spec Del: Std TAT: 15 day

Date Rec'd: 2/26/99 Date Due: 3/13/99

Account #:

Refrigerator #									2		2	2				
#/Type Container	Liquid								1p		1p	2g				
	Solid															
Volume	Liquid								500		500	1ltr				
	Solid															
Preservatives									HNO3		H2SO4	H2SO4				
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb				INORG: Metal	CN						

RECRA LabNet Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb				Metal	CN						
														MERTO MFETO		INH3N	10GGR				
001	BØTM52	✓	✓	W	2/24/99	0928								✓			✓				
2	53					0928								✓			✓				
3	89					0825								✓			✓				
4	BØTP29					0928										✓					

Special Instructions:
saf # C99-020
sdg # H0347

COMPOSITE WASTE

DATE/REVISIONS:
1. Run metals - ICP Trace
2.
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # *
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 5.6 °C

Relinquished by	Received by	Date	Time
Jeder	Jeder	2/26/99	0930

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:
*423379322751

PNNL	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST H0347	C.O.C. # C99-020-3 Page 1 of 1

Collector: Gostovich	Contact/Requester: JH KESSNER	Telephone No.: (509) 372-9538 MSIN FAX
SAF No.: C99-020	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: NPDES GW MONITORING FEBRUARY 1999	Logbook No.: WM SML H21	Ice Chest No.: ARLI-Rcd Temp.: 4C
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235-7952-2751
Protocol: CERCLA	Data Turnaround: 15 Days **PRIORITY**	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **
QL 5.6 272

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☒ No ☐
PRIORITY TURNAROUND: 15 DAYS FAX/45 DAYS SUMMARY
FAX COPIES OF QES & TMA LOG-IN TO DL STEWART (372-1704) & JM DUNCAN (372-9052).

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
✓ B0TM52		W	2-24-99	0928	1x500-mL G/P	Chromium - 218.2 (GFAA); Iron - 236.2	HNO3 to pH <2
✓ B0TM52		W	7	7	1x20-mL P	Activity Scan	None
✓ B0TM52		W			2x1000-mL G	Oil & Grease - 413.1	H2SO4 to pH <2 Cool 4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Gostovich	[signature]	1300	FEB 24 1999	K.J. Young	[signature]	1300	FEB 24 1999
[signature]		02-24-99	1410	Fed Express			2-24-99
Fed Ex			2-25-99 10:45	[signature]	J.R. Cuva		2-25-99 10:45
[signature]				[signature]			[illegible]

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liqui
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wire
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

H0347

C.O.C. # C99-020-4

Page 1 of 1

Collector: Gostovich	Contact/Requester: JH KESSNER	Telephone No.: (509) 372-9538 MSIN FAX 12
SAF No.: C99-020	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: NPDES GW MONITORING, FEBRUARY 1999	Logbook No.: WM-SML-H21	Ice Chest No.: ARL1 RAH Temp. 4C
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235-7952-2751
Protocol: CERCLA	Data Turnaround: 15 Days **PRIORITY**	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☒ No ☐
PRIORITY TURNAROUND: 15 DAYS FAX/45 DAYS SUMMARY
FAX COPIES OF QES & TMA LOG-IN TO DL STEWART (372-1704) & JM DUNCAN (372-9052).

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
✓ B0TM53		W	2-24-99	0928	1x500-mL G/P	Chromium - 218.2 (GFAA); Iron - 236.2	HNO3 to pH <2
✓ B0TM53		W	7	7	1x20-mL P	Activity Scan	None
✓ B0TM53		W			2x1000-mL G	Oil & Grease - 413.1	H2SO4 to pH <2 Cool 4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Gostovich	[signature]	1300	FEB 24 1999	K.J. Young	[signature]	1300	FEB 24 1999
[signature]	1410		2-24-99	Fed Ex			2-24-99
Fed Ex			2-25-99 10:45	[signature]	JR Carso		2-22-99 10:45
[signature]				[signature]			

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liqui
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wine
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

H0347

C99-020-6

Page 1 of 18

Collector: Gostovich	Contact/Requester: JH KESSNER	Telephone No.: (509) 372-9538 MSIN FAX
SAF No.: C99-020	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: NPDES GW MONITORING FEBRUARY 1999	Logbook No.: WMSMLW21	Ice Chest No.: ARLI - Red Temp. 4C
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: — 4235 -7952 -2751
Protocol: CERCLA	Data Turnaround: 15 Days **PRIORITY**	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☒ No ☐
PRIORITY TURNAROUND: 15 DAYS FAX/45 DAYS SUMMARY
FAX COPIES OF QES & TMA LOG-IN TO DL STEWART (372-1704) & JM DUNCAN (372-9052).

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B0TM89		W	2-24-99	0825	1x500-mL G/P	Chromium - 218.2 (GFAA); Iron - 236.2	HNO3 to pH <2
B0TM89		W	7	7	1x20-mL P	Activity Scan	None
B0TM89		W	7	7	2x1000-mL G	Oil & Grease - 413.1	H2SO4 to pH <2 Cool 4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Gostovich	DP [signature]	1300	FEB 24 1999	K.J. Young	[signature]	1300	FEB 24 1999
[signature]	02-24-99	1410		Fed Ex		2-24-99	
Fed Ex		2-25-99	10:45	[signature]	JR Corso	2-25-99	10:45
[signature]				[signature]		[illegible]	[illegible]

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liqui
SO	= Solid	T	= Tissue
SI	= Sludge	WI	= Wine
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

H0347

C.O.C. # C99-020-7

Page 1 of 1

Collector: Gostovich	Contact/Requester: JH KESSNER	Telephone No.: (509) 372-9538 MSIN FAX
SAF No.: C99-020	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: NPDES GW MONITORING, FEBRUARY 1999	Logbook No.: WM SMK-21	Ice Chest No.: AR41-Red Temp. 4C
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT VEHICLE	Bill of Lading/Air Bill No.: 4235-7952-2751
Protocol: CERCLA	Data Turnaround: 15 Days **PRIORITY**	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☒ No ☐
PRIORITY TURNAROUND: 15 DAYS FAX/45 DAYS SUMMARY
FAX COPIES OF QES & TMA LOG-IN TO DL STEWART (372-1704) & JM DUNCAN (372-9052).

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B0TP29		W	2-24-99	0928	1x500-mL G/P	Ammonia - 350.3	H2SO4 to pH <2 Cool 4C
B0TP29		W	〃	〃	1x20-mL P	Activity Scan	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Gostovich			1300 FEB 24 1999	K.J. Young			1300 FEB 24 1999
Jerry Young			02-24-99 1410	Fed Express			2-24-99
Fed Ex			2-25-99 10:45	AR Conrad	JR Cisco		2-25-99 10:45
Jedel							

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wine	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

MAR 1999
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU HANFORD C99-020
RFW# : 9902L272
SDG/SAF# : H0347/C99-020

W.O.# : 10985-001-001-9999-00
Date Received: 02-26-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 3 water samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {MB result is less than 2.2X the IDL or the MB value constitutes less than 10% of the analyte level in the sample}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 85-115% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. All matrix spike (MS) recoveries were within the 70-130% control limits. Refer to the Inorganics Accuracy Report.

11. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 21 pages.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610)-280-3000 • Fax (610) 280-3041

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL).

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

3-8-99
Date

mld/m02-272

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9902L272

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A __3010A __3015 __3020A __3050A __3051 ✓200.7 1994 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B		__200.7				__99
Antimony	__6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	__6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	__6010B		__200.7				__99
Beryllium	__6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	__6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	__6010B		__200.7				__99
Chromium	__6010B	__7191 [5]	✓200.7	__218.2			__SS17
Cobalt	__6010B		__200.7				__99
Copper	__6010B	__7211 [5]	__200.7	__220.2			__99
Iron	__6010B		✓200.7				__99
Lead	__6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	__6010B		__200.7				__99
Manganese	__6010B		__200.7				__99
Mercury	__7470A [3]	__7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	__6010B		__200.7				__99
Potassium	__6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	__6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	__6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	__6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2__200.9			__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	__6010B		__200.7				__99
Zinc	__6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

L-WI-033/M-03/98

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 03/08/99

CLIENT: TNU-HANFORD C99-020

RECRA LOT #: 9902L272

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0TM52	Chromium, Total	1.8	UG/L	0.30	1.0
		Iron, Total	21.8	UG/L	9.0	1.0
-002	B0TM53	Chromium, Total	1.5	UG/L	0.30	1.0
		Iron, Total	29.8	UG/L	9.0	1.0
-003	B0TM89	Chromium, Total	0.32	UG/L	0.30	1.0
		Iron, Total	9.0 u	UG/L	9.0	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/08/99

CLIENT: TNU-HANFORD C99-020

RECRA LOT #: 9902L272

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0137-MB1	Chromium, Total	0.40	UG/L	0.30	1.0
		Iron, Total	9.0 u	UG/L	9.0	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 03/08/99

CLIENT: TNU-HANFORD C99-020

RECRA LOT #: 9902L272

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0TM52	Chromium, Total	208	1.8	200	103.4	1.0
		Iron, Total	1040	21.8	1000	102.0	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 03/08/99

CLIENT: TNU-HANFORD C99-020 RECRA LOT #: 9902L272

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0TM52	Chromium, Total	1.8	1.7	5.7	1.0
		Iron, Total	21.8	21.6	0.92	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 03/08/99

CLIENT: TNU-HANFORD C99-020

RECRA LOT #: 9902L272

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0137-LC1	Chromium, LCS	514	500	UG/L	102.9
		Iron, LCS	5060	5000	UG/L	101.2

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD C99-020

DATE RECEIVED: 02/26/99 RFW LOT # :9902L272

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0TM52						
CHROMIUM, TOTAL	001	W	99L0137	02/24/99	03/04/99	03/04/99
CHROMIUM, TOTAL	001 REP	W	99L0137	02/24/99	03/04/99	03/04/99
CHROMIUM, TOTAL	001 MS	W	99L0137	02/24/99	03/04/99	03/04/99
IRON, TOTAL	001	W	99L0137	02/24/99	03/04/99	03/04/99
IRON, TOTAL	001 REP	W	99L0137	02/24/99	03/04/99	03/04/99
IRON, TOTAL	001 MS	W	99L0137	02/24/99	03/04/99	03/04/99
B0TM53						
CHROMIUM, TOTAL	002	W	99L0137	02/24/99	03/04/99	03/04/99
IRON, TOTAL	002	W	99L0137	02/24/99	03/04/99	03/04/99
B0TM89						
CHROMIUM, TOTAL	003	W	99L0137	02/24/99	03/04/99	03/04/99
IRON, TOTAL	003	W	99L0137	02/24/99	03/04/99	03/04/99

LAB QC:

CHROMIUM LABORATORY	LC1 BS	W	99L0137	N/A	03/04/99	03/04/99
CHROMIUM, TOTAL	MB1	W	99L0137	N/A	03/04/99	03/04/99
IRON LABORATORY	LC1 BS	W	99L0137	N/A	03/04/99	03/04/99
IRON, TOTAL	MB1	W	99L0137	N/A	03/04/99	03/04/99

RECRA LabNet Use Only

9902L272

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-Hanford C99-020
Est. Final Proj. Sampling Date
Project #: L0985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: DJ
QC: Spec Del: Std TAT: 15 day
Date Rec'd: 2/26/99 Date Due: 3/13/99
Account #:

Refrigerator #											2		2	2					
#/Type Container	Liquid										1p		1p	2g					
	Solid																		
Volume	Liquid										500		500	1lr					
	Solid																		
Preservatives											HNO3		HCl	HCl					
ANALYSES REQUESTED →		ORGANIC									INORG								
		VOA	BNA	Pest/PCB	Herb						Metal	CN							

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	RECRA LabNet Use Only														
													HOETO	HFETO		INHZO	IOESR				
001	BØTM52	✓	✓	W	2/26/99	0928							✓				✓				
2	53					0928							✓				✓				
3	89					0825							✓				✓				
4	BØTP29					0928										✓					

Special Instructions:
saf # C99-020
sdg # H0347

COMPOSITE WASTE

DATE/REVISIONS:
1. Run metals - ICP Trace
2.
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # *
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec'd Y or N
Cooler Temp. 5.6 °C

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	2/26/99	0930

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
*4233793232751

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

H0347

C.O.C. # C99-020-3

Page 1 of 1

Collector: Gostovich	Contact/Requester: JH KESSNER	Telephone No.: (509) 372-9538 MSIN FAX
SAF No.: C99-020	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: NPDES GW MONITORING, FEBRUARY 1999	Logbook No.: WM-SMC-421	Ice Chest No.: ARLI-RCA Temp.: 4c
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4233-7952-2751
Protocol: CERCLA	Data Turnaround: 15 Days **PRIORITY**	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **
QL 5.6 272

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☒ No ☐
PRIORITY TURNAROUND: 15 DAYS FAX/45 DAYS SUMMARY
FAX COPIES OF QES & TMA LOG-IN TO DL STEWART (372-1704) & JM DUNCAN (372-9052).

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B0TM52		W	2-24-99	0928	1x500-mL G/P	Chromium - 218.2 (GFAA); Iron - 236.2	HNO3 to pH <2
B0TM52		W	7	7	1x20-mL P	Activity Scan	None
B0TM52		W			2x1000-mL G	Oil & Grease - 413.1	H2SO4 to pH <2 Cool 4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Gostovich			1300 FEB 24 1999	K.J. Evans			1300 FEB 24 1999
Evans			02-24-99 1910	Fed Express			2-24-99
Fed Ex			2-25-99 10:45	J.R. Cuvo			2-25-99 10:45
Delec				Delec			

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liquid	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wine	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

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PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

HC347

C.O.C. # C99-020-4

Page 1 of 1

Collector: Gostovich	Contact/Requester: JH KESSNER	Telephone No.: (509) 372-9538 MSIN FAX
SAF No.: C99-020	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: NPDES GW MONITORING FEBRUARY 1999	Logbook No.: WM-SML-HA1	Ice Chest No.: ACL1 RA1 Temp. 4C
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT VEHICLE	Bill of Lading/Air Bill No.: 4235-7952-2751
Protocol: CERCLA	Data Turnaround: 15 Days **PRIORITY**	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☒ No ☐
PRIORITY TURNAROUND: 15 DAYS FAX/45 DAYS SUMMARY
FAX COPIES OF QES & TMA LOG-IN TO DL STEWART (372-1704) & JM DUNCAN (372-9052).

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B0TM53		W	2-24-99	0928	1x500-mL G/P	Chromium - 218.2 (GFAA); Iron - 236.2	HNO3 to pH <2
B0TM53		W	〃	〃	1x20-mL P	Activity Scan	None
B0TM53		W	〃	〃	2x1000-mL G	Oil & Grease - 413.1	H2SO4 to pH <2 Cool 4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Gostovich			1300 FEB 24 1999	K.J. Young			1300 FEB 24 1999
Relinquished By			Date/Time	Received By			Date/Time
			1410 2-24-99	Fed Ex			2-24-99
Relinquished By			Date/Time	Received By			Date/Time
Fed Ex			2-25-99 10:45				2-25-99 10:45
Relinquished By			Date/Time	Received By			Date/Time
Jeelee							

Matrix *

S = Soil		DS = Drum Solid	
SD = Sediment		DL = Drum Liquid	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wine	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

H0347

C.O.C. # C99-020-6

Page 1 of 1

Collector: Gostovich	Contact/Requester: JH KESSNER	Telephone No.: (509) 372-9538 MSIN FAX
SAF No.: C99-020	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: NPDES GW MONITORING FEBRUARY 1999	Logbook No.: WMS-WM-021	Ice Chest No.: A2LI - Red Temp. 4C
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT VEHICLE	Bill of Lading/Air Bill No.: 4235-7952-2731
Protocol: CERCLA	Data Turnaround: 15 Days **PRIORITY**	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☒ No ☐
PRIORITY TURNAROUND: 15 DAYS FAX/45 DAYS SUMMARY
FAX COPIES OF QES & TMA LOG-IN TO DL STEWART (372-1704) & JM DUNCAN (372-9052).

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B0TM89		W	2-24-99	0805	1x500-mL G/P	Chromium - 218.2 (GFAA); Iron - 236.2	HNO3 to pH <2
B0TM89		W	"	"	1x20-mL P	Activity Scan	None
B0TM89		W	"	"	2x1000-mL G	Oil & Grease - 413.1	H2SO4 to pH <2 Cool 4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Gostovich	DP	[signature]	1300 FEB 24 1999	K.J. Young	[signature]	[signature]	1300 FEB 24 1999
[signature]			02-24-99 1410	Fed Ex			2-24-99
Fed Ex			2-25-99 10:45	[signature]	JR Carson	[signature]	2-25-99 10:45
Jedep				[signature]			

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liquid	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wire	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

H0347

C.O.C. # C99-020-7

Page 1 of 1

Collector: Gostovich	Contact/Requester: JH KESSNER	Telephone No.: (509) 372-9538 MSIN FAX
SAF No.: C99-020	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: NPDES GW MONITORING FEBRUARY 1999	Logbook No.: WM-SML-21	Ice Chest No.: ARSI-Red Temp. 4c
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235-7952-2751
Protocol: CERCLA	Data Turnaround: 15 Days **PRIORITY**	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☒ No ☐
PRIORITY TURNAROUND: 15 DAYS FAX/45 DAYS SUMMARY
FAX COPIES OF QES & TMA LOG-IN TO DL STEWART (372-1704) & JM DUNCAN (372-9052).

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
✓ B0TP29		W	2-24-99	0928	1x500-mL G/P	Ammonia - 350.3	H2SO4 to pH <2 Cool 4C
✓ B0TP29		W	7	7	1x20-mL P	Activity Scan	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Gostovich		[signature]	1300 FEB 24 1999	K.J. Young	Ben Young		1300 FEB 24 1999
Ben Young	02-24-99		1410	Fed Express			2-24-99
Fed Ex		2-25-99	10:45	JR Corso	JR Corso	2-25-99	10:45
Jedel				[illegible]			

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liquid	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wine	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

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