0085276

SAF-RC-118
Columbia River Component of the RCBRA – Tissues
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 2/18/10
INITIAL/DATE

COMMENTS:

SDG SEQ012810A SAF-RC-118

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sampling Location: URSA-CARP 4 FILLET/CARCASS

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Analytical Chemistry Data Package
Inorganics Analysis

Project: Washington Closures Hanford
As Speciation Analysis of Tissue

SDG 121809 and SDG012810

PNNL Project No. 56166
MSL CF No. 2981

Pacific Northwest
NATIONAL LABORATORY

Marine Sciences Laboratory
1529 West Sequim Bay Road
Sequim, WA 98382
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SEQ0128 10A

INORGANIC CHEMISTRY ANALYSIS DATA PACKAGE CONTENTS

As Speciation Analysis in Tissue

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Sample Custody Information

Laboratory Sample Log-In and Chain of Custody Forms for:
SDG121809 10
Laboratory Sample Log-In and Chain of Custody Forms for:
SDG012810 35

BATTELLE MARINE SCIENCES LABORATORY
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Washington Closure Hanford
Arsenic Speciation Study
SDG121809 and SDG012810

MSL Code	Client ID	SDG	Received Date	Collection Date	Analysis Date	Analytical Batch ID	Percent Dry Wt	AsB µg/g dry wt.	DMA µg/g dry wt.	MMA µg/g dry wt.	As^{III} µg/g dry wt.	*Total As* µg/g dry wt.
Method Detection Limit (MDL)								*0.002* [1]	*0.005*	*0.007*	*0.01*	*Cal.*
2981-309	J19679	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	47.7	0.00677	0.0144	0.007 U	0.01 U	*0.0382*
2981-310	J19248	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	37.2	0.00535	0.005 U	0.007 U	0.01 U	*0.0274*
2981-311	J196K1	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	37.3	0.00613	0.0190	0.179	0.0156	*0.220*
2981-312	J196F6	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	32.3	0.00557	0.0223	0.007 U	0.0115	*0.0464*
2981-312DUP	J196F6	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	32.3	0.00796	0.0228	0.007 U	0.0147	*0.0524*
2981-313	J190T5	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	22.3	0.00573	0.00502	0.007 U	0.0108	*0.0286*
2981-314	J190W6	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	27.9	0.00545	0.00680	0.007 U	0.0105	*0.0297*
2981-315	J190W5	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	27.5	0.00434	0.00967	0.007 U	0.0140	*0.0350*
2981-316	J190T4	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	22.1	0.00550	0.00719	0.007 U	0.0107	*0.0304*
2981-317	J19234	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	29.9	0.00592	0.00676	0.007 U	0.0143	*0.0340*
2981-318	J191Y4	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	24.4	0.00773	0.00649	0.007 U	0.0128	*0.0340*
2981-319	J19230	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	32.6	0.00502	0.005 U	0.007 U	0.01 U	*0.0270*
2981-320	J191Y0	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	25.5	0.00663	0.00680	0.007 U	0.01 U	*0.0304*
2981-321	J191R0	121809	12/18/09	12/14/09	01/28/10	012810-LCDRC	30.4	0.00590	0.005 U	0.007 U	0.0146	*0.0325*
2981-322	J191R1	121809	12/18/09	12/14/09	01/28/10	012810-LCDRC	30.9	0.00518	0.005 U	0.007 U	0.0147	*0.0319*
2981-323	J191R2	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	32.1	0.00538	0.00732	0.007 U	0.01 U	*0.0297*
2981-324	J191R3	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	29.9	0.00553	0.00923	0.007 U	0.01 U	*0.0318*
2981-324DUP	J191R3	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	29.9	0.00680	0.00930	0.007 U	0.01 U	*0.0331*
2981-325	J191J3	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	26.3	0.00833	0.005 U	0.007 U	0.01 U	*0.0303*
2981-326	J191J4	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	25.1	0.00582	0.005 U	0.007 U	0.01 U	*0.0278*
2981-327	J191J5	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	24.7	0.0109	0.005 U	0.007 U	0.01 U	*0.0329*
2981-328	J191J6	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	25.2	0.00757	0.005 U	0.007 U	0.01 U	*0.0296*
2981-329	J191J7	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	24.2	0.00834	0.005 U	0.007 U	0.01 U	*0.0303*
2981-330	J191P9	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	30.7	0.00589	0.005 U	0.007 U	0.01 U	*0.0279*
2981-336	J19249	12810	01/28/10	01/21/10	02/05/10	020510-LCDRC	37.3	0.0126	0.005 U	0.007 U	0.01 U	*0.0346*
2981-337	J19680	12810	01/28/10	01/21/10	02/05/10	020510-LCDRC	45.2	0.00429	0.005 U	0.007 U	0.0107	*0.0270*
QUALITY CONTROL SAMPLE RESULTS						*Average*	*38.4*					
Method Blank												
Blank R1					01/28/10	012810-LCDRC		0.002 U	0.005 U	0.007 U	0.01 U	*NA*
Blank R2					02/05/10	020510-LCDRC		0.00302	0.005 U	0.007 U	0.01 U	*NA*
Standard Reference Material												
DORM-2 r1					01/28/10	012810-LCDRC		13.0	0.344	0.007 U	0.01 U	*13.4*
DORM-2 r2					02/05/10	020510-LCDRC		14.0	0.321	0.007 U	0.01 U	*14.4*
Certified Value								**16.4**	NA	NA	NA	**18.0**
% Recovery								**79%**				**74%**
% Recovery								**85%**				**80%**
Blank Spike Results												
LCS R1					01/28/10	012810-LCDRC		1.83	1.82	1.91	3.56	*9.12*
Spike								2.00	2.00	2.00	4.00	*10.0*
% Rec								**92%**	**91%**	**96%**	**89%**	**91%**
LCS R2					02/05/10	020510-LCDRC		2.17	1.96	1.91	3.65	*9.69*
Spike								2.20	2.00	2.00	4.00	*10.2*
% Rec								**99%**	**98%**	**95%**	**91%**	**95%**

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Washington Closure Hanford
Arsenic Speciation Study
SDG121809 and SDG012810

MSL Code	Client ID	SDG	Received Date	Collection Date	Analysis Date	Analytical Batch ID	Percent Dry Wt	AsB µg/g dry wt.	DMA µg/g dry wt.	MMA µg/g dry wt.	As^{1-5} µg/g dry wt.	*Total As* µg/g dry wt.
Method Detection Limit (MDL)								*0.002* [1]	*0.005*	*0.007*	*0.01*	*Cal.*
Replicate Analysis Results												
2981-312	J196F6	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	32.3	0.00557	0.0223	0.007 U	0.0115	*0.0464*
2981-312DUP	J196F6	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	32.3	0.00796	0.0228	0.007 U	0.0147	*0.0524*
	RPD							**35% *2**	**2%**	NA	**24%**	**12%**
2981-324	J191R3	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	29.9	0.00553	0.00923	0.007 U	0.01 U	*0.0318*
2981-324DUP	J191R3	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	29.9	0.00680	0.00930	0.007 U	0.01 U	*0.0331*
	RPD							**21%**	**1%**	NA	NA	**4%**
Matrix Spike Accuracy												
2981-310	J19248	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	37.2	0.00535	0.005 U	0.007 U	0.01 U	*0.0274*
2981-310 MS								2.41	1.64	1.97	4.05	*10.1*
2981-310 MSD								2.26	1.49	2.23	3.83	*9.81*
Spike Amount, MS								2.47	2.47	2.47	4.94	*12.3*
Spike Amount, MSD								2.54	2.54	2.54	5.08	*12.7*
% Recovery, MS								**97%**	NA	NA	**82%**	**81%**
% Recovery, MSD								**89%**	NA	NA	**75%**	**77%**
RPD								**9%**	NA	NA	**8%**	**5%**
2981-325	J191J3	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	26.3	0.00833	0.005 U	0.007 U	0.01 U	*0.0303*
2981-325 MS								2.36	1.42	1.65	3.49	*8.92*
2981-325 MSD								2.60	1.65	1.88	4.02	*10.1*
Spike Amount, MS								2.40	2.18	2.18	4.36	*11.1*
Spike Amount, MSD								2.64	2.40	2.40	4.81	*12.3*
% Recovery, MS								**98%**	NA	NA	**80%**	**80%**
% Recovery, MSD								**98%**	NA	NA	**84%**	**83%**
RPD								**0%**	NA	NA	**4%**	**3%**

NOTES: Arsenobetaine (AsB)
Dimethylarsinic acid (DMA)
Monomethyarsonic acid (MMA)
Arsenate (V or As^{5+})
Arsenite (III or As^{3+})
Total Inorganic Arsenic = As^{3-5}
Total As = Sum of AsB, DMA, MMA, and As^{3-5}
Cal = Calculated Value

[1] Method detection limit (MDL) for AsB calculated from instrument detection limit converted to µg/g using the average sample mass and volume for this project.
[2] Concentration less than 3 times the MDL, not valid for data quality control evaluation
U Not detected at or above MDL shown
NS Not spiked
N Outside Method DQOs for Blank Spikes (≤ 15%), MS/MSD (≤ 25%), SRM (≤ 25%) results
* Outside Method DQOs for Duplicates (≤ 25%)

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Washington Closure Hanford
Arsenic Speciation Study
Wet Weight Conversion Table
SDG121809 and SDG012810

MSL Code	Client ID	SDG	Received Date	Collection Date	Analysis Date	Analytical Batch ID	AsB µg/g wet wt.	DMA µg/g wet wt.	MMA µg/g wet wt.	As^{1-5} µg/g wet wt.	*Total As* µg/g wet wt.
Method Detection Limit (MDL)							*0.00061*	*0.002*	*0.002*	*0.003*	*Cal.*
2981-309	J19679	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00323	0.00687	0.002 U	0.003 U	*0.0151*
2981-310	J19248	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00199	0.002 U	0.002 U	0.003 U	*0.00885*
2981-311	J196K1	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00229	0.00709	0.0669	0.00584	*0.0822*
2981-312	J196F6	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00180	0.00721	0.002 U	0.00372	*0.0147*
2981-312DUP	J196F6	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00257	0.00736	0.002 U	0.00474	*0.0167*
2981-313	J190T5	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00128	0.00112	0.002 U	0.003 U	*0.00740*
2981-314	J190W6	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00152	0.00190	0.002 U	0.003 U	*0.00842*
2981-315	J190W5	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00119	0.00266	0.002 U	0.00385	*0.00969*
2981-316	J190T4	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00122	0.00159	0.002 U	0.003 U	*0.00781*
2981-317	J19234	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00177	0.00202	0.002 U	0.00427	*0.0101*
2981-318	J191Y4	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00189	0.00159	0.002 U	0.00313	*0.00860*
2981-319	J19230	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00164	0.002 U	0.002 U	0.003 U	*0.00826*
2981-320	J191Y0	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00169	0.00174	0.002 U	0.003 U	*0.00843*
2981-321	J191R0	121809	12/18/09	12/14/09	01/28/10	012810-LCDRC	0.00179	0.002 U	0.002 U	0.00443	*0.00974*
2981-322	J191R1	121809	12/18/09	12/14/09	01/28/10	012810-LCDRC	0.00160	0.002 U	0.002 U	0.00455	*0.00970*
2981-323	J191R2	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	0.00173	0.00235	0.002 U	0.003 U	*0.00908*
2981-324	J191R3	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	0.00165	0.00276	0.002 U	0.003 U	*0.00941*
2981-324DUP	J191R3	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	0.00203	0.00278	0.002 U	0.003 U	*0.00981*
2981-325	J191J3	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	0.00219	0.002 U	0.002 U	0.003 U	*0.00874*
2981-326	J191J4	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	0.00146	0.002 U	0.002 U	0.003 U	*0.00801*
2981-327	J191J5	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	0.00268	0.002 U	0.002 U	0.003 U	*0.00923*
2981-328	J191J6	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	0.00191	0.002 U	0.002 U	0.003 U	*0.00846*
2981-329	J191J7	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	0.00202	0.002 U	0.002 U	0.003 U	*0.00857*
2981-330	J191P9	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	0.00181	0.002 U	0.002 U	0.003 U	*0.00835*
2981-336	J19249	12810	01/28/10	01/21/10	02/05/10	020510-LCDRC	0.00469	0.002 U	0.002 U	0.003 U	*0.0112*
2981-337	J19680	12810	01/28/10	01/21/10	02/05/10	020510-LCDRC	0.00194	0.002 U	0.002 U	0.00485	*0.0103*

QUALITY CONTROL SAMPLE RESULTS *Average*

Method Blank

Blank R1	01/28/10	012810-LCDRC
Blank R2	02/05/10	020510-LCDRC

Standard Reference Material

DORM-2 r1	01/28/10	012810-LCDRC
DORM-2 r2	02/05/10	020510-LCDRC

Certified Value
% Recovery
% Recovery

Blank Spike Results

LCS R1	01/28/10	012810-LCDRC
Spike		
% Rec		
LCS R2	02/05/10	020510-LCDRC
Spike		
% Rec		

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Arsenic Speciation Study
Wet Weight Conversion Table
SDG121809 and SDG012810

MSL Code	Client ID	SDG	Received Date	Collection Date	Analysis Date	Analytical Batch ID	AsB µg/g wet wt.	DMA µg/g wet wt.	MMA µg/g wet wt.	As^{3-5} µg/g wet wt.	*Total As* µg/g wet wt.
Method Detection Limit (MDL)							*0.00061* [1]	*0.002*	*0.002*	*0.003*	*Cal.*
Replicate Analysis Results											
2981-312	J196F6	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00180	0.00721	0.002 U	0.00372	*0.0147*
2981-312DUP	J196F6	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00257	0.00736	0.002 U	0.00474	*0.0167*
	RPD										
2981-324	J191R3	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	0.00165	0.00276	0.002 U	0.003 U	*0.00941*
2981-324DUP	J191R3	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	0.00203	0.00278	0.002 U	0.003 U	*0.00981*
	RPD										
Matrix Spike Accuracy											
2981-310	J19248	121809	12/18/09	12/15/09	01/28/10	012810-LCDRC	0.00199	0.002 U	0.002 U	0.003 U	*0.00885*
2981-310 MS											
2981-310 MSD											
Spike Amount, MS											
Spike Amount, MSD											
% Recovery, MS											
% Recovery, MSD											
RPD											
2981-325	J191J3	121809	12/18/09	12/14/09	02/05/10	020510-LCDRC	0.00219	0.002 U	0.002 U	0.003 U	*0.00874*
2981-325 MS											
2981-325 MSD											
Spike Amount, MS											
Spike Amount, MSD											
% Recovery, MS											
% Recovery, MSD											
RPD											

NOTES: Arsenobetaine (AsB)
Dimethylarsinic acid (DMA)
Monomethyarsonic acid (MMA)
Arsenate (V or As^{5+})
Arsenite (III or As^{3+})
Total Inorganic Arsenic = As^{3-5}
Total As = Sum of AsB, DMA, MMA, and As^{3-5}
Cal = Calculated Value

[1] Method detection limit (MDL) for AsB calculated from instrument detect
converted to µg/g using the average sample mass and volume for this p
[2] Concentration less than 3 times the MDL, not valid for data quality contr
U Not detected at or above MDL shown
NS Not spiked
N Outside Method DQOs for Blank Spikes (≤ 15%), MS/MSD (≤ 25%), SR
* Outside Method DQOs for Duplicates (≤ 25%)

QA/QC NARRATIVE

PROJECT:	Washington Closures Hanford SDG121809 and SDG012810
PARAMETER:	Arsenic Speciation - Total Inorganic Arsenic (TIA)
LABORATORY:	Pacific Northwest National Laboratory (PNNL) operated by Battelle, Marine Sciences Laboratory (MSL), Sequim, Washington
MATRIX:	Tissue Homogenate
SAMPLE CUSTODY AND PROCESSING:	Tissue samples were received at MSL on 12/18/09 and 01/28/10. All samples were received in good condition (i.e., no sample containers were broken or leaking). Samples were assigned a Battelle Central File (CF) identification number (2981) and were entered into the MSL sample tracking and project management system.

SAMPLE PROCESSING INFORMATION:

MSL Code:	**SDG121809: 2981*309-330**	**SDG012810: 2981*336-337**
Description:	Freshwater Fish Homogenate	Freshwater Fish Homogenate
Collection dates	12/14/09 and 12/15/09	01/21/10
Laboratory arrival date	12/18/09	01/28/10
Cooler temperature on arrival	1.8°C	2.9°C
Extraction Dates:	01/27/10 and 01/28/10	
Analyses Dates:	01/28/10 and 02/05/10	

METHODS:

The tissue homogenate was processed and analyzed for total inorganic arsenic defined as the sum of arsenate (V or As5+) and arsenite (III or As3+) following MSL standard operating procedure MSL-I-037 Arsenic Speciation using High Performance Liquid Chromatography – Inductively Coupled Plasma Mass Spectrometry (HPLC-ICP-MS) in Aqueous, Sediment, and Tissue Samples. This method was developed from guidance in EPA Method 1632 for the speciation of arsenic in waters. This method is applicable to the determination of total inorganic arsenic (As) and arsenic species in drinking, surface, groundwater, seawater, tissue and sediment extracts. The anionic or cationic arsenic species are separated by an anion ion exchange column on high-performance liquid chromatography (HPLC) followed by detection and quantification using inductively coupled plasma – mass spectrometry with a dynamic reaction cell accessory (ICP-DRC-MS). This method quantitatively determines organic species of arsenic including arsenobetaine (AsB), dimethylarsinic acid (DMA), monomethyarsonic acid (MMA), and can be set up to separate the inorganic oxidation states of 3+ and 5+. This allows risk assessment to be conducted on a chemical species of interest rather than just the total arsenic. This is particularly significant for arsenic as the toxicity is highly dependent on the chemical species, with the most toxic being the As3+ oxidation state. The data for the organic arsenic species were included along with the total inorganic arsenic determined as the sum of the inorganic oxidation states of 3+ and 5+. The quality control evaluated was conducted only on the total inorganic arsenic concentration identified in the table as As^{3+5}.

Upon arrival at MSL, the wet tissue samples were stored at <-18°C until samples were lyophilized. Approximately 500 mg of dried, homogenized tissue was extracting using deionized water and sodium hydroxide (NaOH). An aliquot of the supernatant is subsequently analyzed for arsenic species using the HPLC coupled with the ICP-DRC-MS. Analytical results are reported in µg/g dry weight. These concentrations are then converted back to a wet weight concentration using the following formula: wet weight concentration = dry weight concentration * % dry weight / 100.

QA/QC NARRATIVE

NOTE: The data for arsenobetaine (AsB), dimethylarsinic acid (DMA), monomethyarsonic acid (MMA) are reported for information purposes only. The data are quantitatively determined, but the MSL QA program only validates the analytes requested by the client. The requested species of arsenic is the total inorganic arsenic, which is the sum of the two inorganic oxidation states of 3+ and 5+. The other arsenic species may be validated upon request. The quality control review below applies only to the As^{3+5} data.

HOLDING TIMES: Wet tissue samples were stored at either 4 °C, frozen, or at ≤ -18 °C from time of collection to analysis. Holding times are 28 days at 4 ± 2 °C and 180 days at ≤ -18 °C. Dry samples in plastic or glass jars may be stored at room temperature for 180 days. The samples were received 4-5 days after collection and stored at ≤ -18 °C and then lyophilized. With these storage requirements the samples were analyzed within the 180 days from collection.

DATA QUALITY CRITERIA (DQC):

Analyte	Analytical Method	Range of Blank Spike Recovery	Range of MS/MSD Spike Recovery	SRM Percent Recovery	Replicate Precisions (RPD)	Achieved MDL (µg/g dry wt.)	Achieved MDL (µg/g wet wt.)
AsB	HPLC/ICP-DRC-MS	NA	NA	NA	NA	0.002 µg/g	0.0006 µg/g
DMA	HPLC/ICP-DRC-MS	NA	NA	NA	NA	0.005 µg/g	0.001 µg/g
MMA	HPLC/ICP-DRC-MS	NA	NA	NA	NA	0.007 µg/g	0.002 µg/g
As^{3+5}	HPLC/ICP-DRC-MS	85-115%	75-125%	±25%	≤25%	0.01 µg/g	0.003 µg/g

NA = Data quality not applicable to the organic arsenic species for this project.

DETECTION LIMITS: Analytical results were reported to the laboratory achieved method detection limits (MDL) as determined from the Annual MDL study. The MDLs were determined according to EPA's "Definition and Procedure for the Determination of the Method Detection Limit - revision 1.11" 40 CFR Part 136, Appendix B. The only exception is the MDL determined for the AsB, which was the instrument detection limit converted from µg/L to µg/g using the average sample mass and volume for these samples. Data were evaluated and flagged in accordance with the following criteria:

U Undetected at the MDL, MDL reported.

* Duplicates outside the QC sample criterion.

N Spikes outside the QC sample criterion.

METHOD BLANKS: Method blanks were prepared and analyzed with the samples at a frequency of one each per analytical batch of 20 or fewer samples. Two analytical batches are reported for this data set. Total inorganic arsenic was not detected in either of the method blanks.

LABORATORY CONTROL SAMPLE (LCS) ACCURACY: Laboratory control samples (LCS) were prepared and analyzed at a frequency of one each per analytical batch of 20 or fewer samples. The LCS consists of reagents spiked with the arsenic species of interest that are processed and analyzed with the samples. The LCS samples were within the QC criterion of 85-115% recovery.

QA/QC NARRATIVE

REPLICATE PRECISION: Laboratory duplicates were analyzed at a frequency of one each per 20 field samples or analytical batch. Two duplicates were prepared and analyzed with this SDG. The total inorganic arsenic duplicate was within the QC criterion of ≤25% RPD. Due to the low concentrations of TiAs, analytical precision was also assessed using the matrix spike duplicates and were within the QC acceptance criterion of ≤25% RPD.

MATRIX SPIKE ACCURACY: The analytical method requires a matrix spike at a frequency of one per 20 samples or analytical batch. A matrix spike duplicate was also added to provide a measure of precision (as discussed above). The TiAs matrix spikes were within the QC criterion of 75-125% recovery.

STANDARD REFERENCE MATERIAL: The standard reference material (SRM) Dorm-2 Dogfish Mussel was prepared and analyzed with each analytical batch. The SRM is not certified for total inorganic arsenic, but certified values for AsB and total As are provided for reference.

REFERENCES:

Francesconi, K.A. and Kuehnelt, D., 2004. Determination of arsenic species: A critical review of methods and application, 2000-2003. Analyst, 129: 373-395.

Gong, Z., Lu, X., Ma, M., Watt, C., Le, C., 2002. Arsenic speciation analysis. Talanta, 58: 77-96

Mandal, B.K., Ogra, Y., Suzuki, K.T., 2003. Speciation of arsenic in human nail and hair from arsenic-affected area by HPLC-inductively coupled argon plasma mass spectrometry. Toxicol. Appl. Pharmacol., 189: 73-83.

U.S. EPA, 2000. Method 1632, Revision A (1632A), Chemical Speciation of Arsenic in Water and Tissue by Hydride Generation Quartz Furnace atomic Absorption Spectrometry.

Pacific Northwest NATIONAL LABORATORY | Battelle The Business of Innovation

SAMPLE LOGIN

Project Manager: Brandenberger
Date Received: 12/18/09
Batch: 22
Login Designee: Mcgahan

Marine Sciences Laboratory
1529 West Sequim Bay Road
Sequim, Washington 98382
PH: (360) 681-4565

Project: **Washington Closure Hanford**

Sponsor ID	Site Description	Battelle Code	Matrix	Storage Location	Requested Parameters	Collection Date
J19679	na	2981-309	other solid	Deep Freezer B-1	Total Inorganic As	12/15/09
J19248	na	2981-310	other solid	Deep Freezer B-1	Total Inorganic As	12/15/09
J196K1	na	2981-311	other solid	Deep Freezer B-1	Total Inorganic As	12/15/09
J196F6	na	2981-312	other solid	Deep Freezer B-1	Total Inorganic As	12/15/09
J190T5	na	2981-313	other solid	Deep Freezer B-1	Total Inorganic As	12/15/09
J190W6	na	2981-314	other solid	Deep Freezer B-1	Total Inorganic As	12/15/09
J190W5	na	2981-315	other solid	Deep Freezer B-1	Total Inorganic As	12/15/09
J190T4	na	2981-316	other solid	Deep Freezer B-1	Total Inorganic As	12/15/09
J19234	na	2981-317	other solid	Deep Freezer B-1	Total Inorganic As	12/15/09
J191Y4	na	2981-318	other solid	Deep Freezer B-1	Total Inorganic As	12/15/09
J19230	na	2981-319	other solid	Deep Freezer B-1	Total Inorganic As	12/15/09
J191Y0	na	2981-320	other solid	Deep Freezer B-1	Total Inorganic As	12/15/09
J191R0	na	2981-321	other solid	Deep Freezer B-1	Total Inorganic As	12/14/09
J191R1	na	2981-322	other solid	Deep Freezer B-1	Total Inorganic As	12/14/09
J191R2	na	2981-323	other solid	Deep Freezer B-1	Total Inorganic As	12/14/09
J191R3	na	2981-324	other solid	Deep Freezer B-1	Total Inorganic As	12/14/09
J191J3	na	2981-325	other solid	Deep Freezer B-1	Total Inorganic As	12/14/09
J191J4	na	2981-326	other solid	Deep Freezer B-1	Total Inorganic As	12/14/09
J191J5	na	2981-327	other solid	Deep Freezer B-1	Total Inorganic As	12/14/09
J191J6	na	2981-328	other solid	Deep Freezer B-1	Total Inorganic As	12/14/09

Pacific Northwest NATIONAL LABORATORY | Battelle The Business of Innovation

SAMPLE LOGIN

Project Manager: Brandenberger
Date Received: 12/18/09
Batch: 22
Login Designee: Mcgahan

Marine Sciences Laboratory
1529 West Sequim Bay Road
Sequim, Washington 98382
PH: (360) 681-4565

Project: **Washington Closure Hanford**

Sponsor ID	Site Description	Battelle Code	Matrix	Storage Location	Requested Parameters	Collection Date
J191J7	na	2981-329	other solid	Deep Freezer B-1	Total Inorganic As	12/14/09
J191P9	na	2981-330	other solid	Deep Freezer B-1	Total Inorganic As	12/14/09

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-948	Page 1 of 1
Collector: WENDY WEST	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9K N; Data Turnaround: 45 Days
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: URSA-CARP 3 CARCASS	SAF No.: RC-118	
Ice Chest No.: 3D	Field Logbook No.: EL-1638; COA: BESCRC6520	Method of Shipment: FED EX	
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: FDX 7931133394 31	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C										
Type of Container	P/G										
No. of Container(s)	1										
Volume	15mL										
SAMPLE ANALYSIS	Total Inoganic Arsenic										
Sample No.	Matrix *	Sample Date	Sample Time								
J19679 2981.309	OTHER SOLID	12/15/09	1700	X							

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: WENDY WEST wendy west	Date/Time: 1700 12/15/09	Received By/Stored In: FAS LOCKED STORAGE2 wendy west wendy west	Date/Time: 1700 12/15/09
Relinquished By/Removed From: FAS LOCKED STORAGE2	Date/Time: 12/17/09 1230	Received By/Stored In: SHANNAN JOHNSON	Date/Time: 12/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	Date/Time: 12/17/09 1230	Received By/Stored In: FDX	Date/Time: 12/18/09 1600
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

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-600	Page 1 of 1
Collector: WENDY WEST	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: ~~9K~~ N; Data Turnaround: 45 Days
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: URSA-CARP 3 FILLET	SAF No.: RC-118	
Ice Chest No.: 3D	Field Logbook No.: EL-1638; COA: BESCRC6520	Method of Shipment: FED EX	
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: FL 7931 1339 431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C										
Type of Container	P/G										
No. of Container(s)	1										
Volume	15mL										
SAMPLE ANALYSIS	Total Inorganic Arsenic										

Sample No.	Matrix *	Sample Date	Sample Time									
J19248 2981.310	OTHER SOLID	12/15/09	1630	X								

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: WENDY WEST	Date/Time: 12/15/09 1630	Received By/Stored In: FAS LOCKED STORAGE 2	Date/Time: 12/15/09 1630
Relinquished By/Removed From: FAS LOCKED STORAGE 2	Date/Time: 12/17/09 1230	Received By/Stored In: SHANNAN JOHNSON	Date/Time: 12/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	Date/Time: 12/17/09 1230	Received By/Stored In: FDX	Date/Time: 12/18/09 1600
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

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-1029	Page 1 of 1
Collector: WENDY WEST	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9K N; Data Turnaround: 45 Days
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: 300SA-CARP 2 CARCASS	SAF No.: RC-118	SAF 91009
Ice Chest No.: 3D	Field Logbook No.: EL-1638; COA: BESCRC6520	Method of Shipment: FED EX	
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: 7931133394 31	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C										
Type of Container	P/G										
No. of Container(s)	1										
Volume	15mL										
SAMPLE ANALYSIS	Total Inoganic Arsenic										
Sample No.	Matrix *	Sample Date	Sample Time								
J196K1 2981. 310	OTHER SOLID	12/15/09	1600	X							
311											

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: WENDY WEST	1600 12/15/09	Received By/Stored In: FAS LOCKED STORAGE 2	1600 12/15/09
Relinquished By/Removed From: FAS LOCKED STORAGE 2	12/17/09 1230	Received By/Stored In: SHANNAN JOHNSON	12/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	12/17/09 1230	Received By/Stored In: FDX	
Relinquished By/Removed From		Received By/Stored In: Jim Brack	12/18/09 1600
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-118-1004	Page 1 of 1
Collector WENDY WEST	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9K N 9/1009
Project Designation Columbia River Component of the RCBRA - Tissues	Sampling Location 300SA-CARP 2 FILLET		SAF No. RC-118	Data Turnaround 45 Days
Ice Chest No. 3D	Field Logbook No. EL-1638	COA BESCRC6520	Method of Shipment FED EX	
Shipped To Battelle Marine Sciences	Offsite Property No. N/A		Bill of Lading/Air Bill No. 793113339431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C										
Type of Container	P/G										
No. of Container(s)	1										
Volume	15mL										
SAMPLE ANALYSIS	Total Inoganic Arsenic										

Sample No.	Matrix *	Sample Date	Sample Time									
J196F6 2981.312	OTHER SOLID	12/15/09	1530	X								

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From WENDY WEST	Date/Time 1530 12/15/09	Received By/Stored In FAS LOCKED STORAGE	Date/Time 1530 12/15/09
Relinquished By/Removed From FAS LOCKED STORAGE	Date/Time 2/17/09 1230	Received By/Stored In SHANNAN JOHNSON	Date/Time 2/17/09 1230
Relinquished By/Removed From SHANNAN JOHNSON	Date/Time 2/17/09 1230	Received By/Stored In FDX	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In JMBrunner	Date/Time 12/18/09 1600
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

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-462	Page 1 of 1

Collector: WENDY WEST	Company Contact: JOAN KESSNER Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9K ~~N~~ 4461709 Data Turnaround: 45 Days
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: URSA-SUCKER5-FILLET	SAF No.: RC-118	
Ice Chest No.: 3D	Field Logbook No.: EL-1638 COA: BESCRC6520	Method of Shipment: FED EX	
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: FDX 793113339431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C										
Type of Container	P/G										
No. of Container(s)	1										
Volume	15mL										
SAMPLE ANALYSIS	Total Inoganic Arsenic										
Sample No. / Matrix * / Sample Date / Sample Time											
J190T5 2981.313 / OTHER SOLID / 12/15/09 / 1430	X										

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: WENDY WEST	1430 12/15/09	EAS LOCKED STORAGE	1430 12/15/09
Relinquished By/Removed From: EAS LOCKED STORAGE	12/17/09 1230	SHANNAN JOHNSON	12/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	12/17/09 1230	FDX	
Relinquished By/Removed From			12/19/09 1600
Relinquished By/Removed From			
Relinquished By/Removed From			

SPECIAL INSTRUCTIONS

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-482	Page 1 of 1

Collector: WENDY WEST	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: ~~9K~~ N	Data Turnaround: 45 Days		
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: URSA-SUCKER5-CARCASS		SAF No.: RC-118
Ice Chest No.: 3D	Field Logbook No.: EL-1638	COA: BESCRC6520	Method of Shipment: FED EX
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: FL 931133943 1

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C											
Type of Container	P/G											
No. of Container(s)	1											
Volume	15mL											
SAMPLE ANALYSIS	Total Inoganic Arsenic											
Sample No.	Matrix *	Sample Date	Sample Time									
J190W6 2381.314	OTHER SOLID	12/15/09	1500	X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: WENDY WEST	1500 12/15/09	Received By/Stored In: EAS LOCKED STORAGE2	1500 12/15/09
Relinquished By/Removed From: EAS LOCKED STORAGE2	12/17/09 1230	Received By/Stored In: SHANNAN JOHNSON	12/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	12/17/09 1230	Received By/Stored In: FDX	
Relinquished By/Removed From		Received By/Stored In:	12/18/09 1600
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-481	Page 1 of 1
Collector: WENDY WEST	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9K N; Data Turnaround: 45 Days
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: URSA-SUCKER4-CARCASS	SAF No.: RC-118	SAP 71309
Ice Chest No.: 30	Field Logbook No.: EL-1638; COA: BESCRC6520	Method of Shipment: FED EX	
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: FDX 793113339431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C										
Type of Container	P/G										
No. of Container(s)	1										
Volume	15mL										
SAMPLE ANALYSIS	Total Inoganic Arsenic										
Sample No.	Matrix *	Sample Date	Sample Time								
J190W5 2981-315	OTHER SOLID	12/15/09	1400	X							

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: WENDY WEST	1400 12/15/09	FAS LOCKED STORAGE2	1400 12/15/09
Relinquished By/Removed From: FAS LOCKED STORAGE2	12/17/09 1230	SHANNAN JOHNSON	12/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	12/17/09 1230	FDX	
Relinquished By/Removed From		Jim Brooks	12/18/09 1600
Relinquished By/Removed From			
Relinquished By/Removed From			

SPECIAL INSTRUCTIONS

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-118-461	Page 1 of 1
Collector WENDY WEST	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code ~~9K~~ N 4/D 61709 — Data Turnaround 45 Days
Project Designation Columbia River Component of the RCBRA - Tissues	Sampling Location URSA-SUCKER4-FILLET		SAF No. RC-118	
Ice Chest No. 3D	Field Logbook No. EL-1638	COA BESCRC6520	Method of Shipment FED EX	
Shipped To Battelle Marine Sciences	Offsite Property No. N/A		Bill of Lading/Air Bill No. FI 793113339431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C											
Type of Container	P/G											
No. of Container(s)	1											
Volume	15mL											
SAMPLE ANALYSIS	Total Inoganic Arsenic											

Sample No.	Matrix *	Sample Date	Sample Time										
J190T4 2981316	OTHER SOLID	12/15/09	1330	X									

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From WENDY WEST	Date/Time 1330 12/15/09	Received By/Stored In FAS LOCKED STORAGE 2	Date/Time 1330 12/15/09
Relinquished By/Removed From FAS LOCKED STORAGE 2	Date/Time 12/17/09 1230	Received By/Stored In SHANNAN JOHNSON	Date/Time 12/17/09 1230
Relinquished By/Removed From SHANNAN JOHNSON	Date/Time 12/17/09 1230	Received By/Stored In FDX	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time 12/18/09 1600
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

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-587	Page 1 of 1
Collector: WENDY WEST	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9K N; Data Turnaround: 45 Days
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: LWSA-SUCKER 5 -CARCASS	SAF No.: RC-118	AA 72009
Ice Chest No.: 3D	Field Logbook No.: EL-1638; COA: BESCRC6520	Method of Shipment: FED EX	
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: FDX# 7931 3339 431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C										
Type of Container	P/G										
No. of Container(s)	1										
Volume	15mL										
SAMPLE ANALYSIS	Total Inoganic Arsenic										
Sample No.	Matrix *	Sample Date	Sample Time								
J19234 2981-317	OTHER SOLID	12/15/09	1230	X							

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: WENDY WEST	1230 12/15/09	FAS LOCKED STORAGE	1230 12/15/09
Relinquished By/Removed From: FAS LOCKED STORAGE	12/17/09 1230	SHANNAN JOHNSON	12/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	12/17/09 1230	FDX	
Relinquished By/Removed From		Received By/Stored In: Jim Brauer	12/18/09 1600
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-567	Page 1 of 1

Collector: WENDY WEST	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9K N	Data Turnaround: 45 Days		
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: LWSA-SUCKER 5 -FILLET		SAF No.: RC-118
SAF 72009			
Ice Chest No.: 3D	Field Logbook No.: EL-1638	COA: BESCRC6520	Method of Shipment: FED EX
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: FDX 7931 1339 431

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C											
Type of Container	P/G											
No. of Container(s)	1											
Volume	15mL											
SAMPLE ANALYSIS	Total Inoganic Arsenic											
Sample No.	Matrix *	Sample Date	Sample Time									
J191Y4 2981-318	OTHER SOLID	12/15/09	1200	X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: WENDY WEST Wendy West	1200 12/15/09	Received By/Stored In: FAS LOCKED STORAGE2 Wendy West Wendy West	1200 12/15/09
Relinquished By/Removed From: FAS LOCKED STORAGE2	12/17/09 1230	Received By/Stored In: SHANNAN JOHNSON	12/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	12/17/09 1230	Received By/Stored In: FDX	
Relinquished By/Removed From		Received By/Stored In: JM Brandenberg	12/18/09 1600
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-118-583	Page 1 of 1
Collector WENDY WEST	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9K N 72009 / Data Turnaround 45 Days
Project Designation Columbia River Component of the RCBRA - Tissues	Sampling Location LWSA-SUCKER 1 -CARCASS		SAF No. RC-118	
Ice Chest No. 3D	Field Logbook No. EL-1638	COA BESCRC6520	Method of Shipment FED EX	
Shipped To Battelle Marine Sciences	Offsite Property No. N/A		Bill of Lading/Air Bill No. 793113339431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C											
Type of Container	P/G											
No. of Container(s)	1											
Volume	15mL											
SAMPLE ANALYSIS	Total Inoganic Arsenic											

Sample No.	Matrix *	Sample Date	Sample Time									
J19230 2981-319	OTHER SOLID	12/15/09	1130	X								

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From WENDY WEST	Date/Time 1130 12/15/09	Received By/Stored In FAS LOCKED STORAGE 2	Date/Time 1130 12/15/09
Relinquished By/Removed From FAS LOCKED STORAGE 2	Date/Time 12/17/09 1230	Received By/Stored In SHANNAN JOHNSON	Date/Time 12/17/09 1230
Relinquished By/Removed From SHANNAN JOHNSON	Date/Time 12/17/09 1230	Received By/Stored In FDX	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In J M Brandeberg	Date/Time 12/18/09 1600
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

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-563	Page 1 of 1
Collector: WENDY WEST	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9K N; Data Turnaround: 45 Days
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: LWSA-SUCKER 1 -FILLET	SAF No.: RC-118	MD 72009
Ice Chest No.: 3D	Field Logbook No.: EL-1638; COA: BESCRC6520	Method of Shipment: FED EX	
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A	Bill of Lading/Airbill No.: FDX 7931 3339 431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C										
Type of Container	P/G										
No. of Container(s)	1										
Volume	15mL										
SAMPLE ANALYSIS	Total Inoganic Arsenic										
Sample No.	Matrix *	Sample Date	Sample Time								
J191Y0 2981-320	OTHER SOLID	12/15/09	1100	X							

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: WENDY WEST	1100 12/15/09	Received By/Stored In: FAS LOCKED STORAGE 2	1100 12/15/09
Relinquished By/Removed From: FAS LOCKED STORAGE 2	12/17/09 1230	Received By/Stored In: SHANNAN JOHNSON	12/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	12/17/09 1230	Received By/Stored In: FDX	
Relinquished By/Removed From		Received By/Stored In: JM Brandenburg	12/18/09 1600
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-118-514	Page 1 of 1
Collector: WENDY WEST	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9~~K~~ N; Data Turnaround: 45 Days
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: 100SA-SUCKER 2 -CARCASS		SAF No.: RC-118	AB 71509
Ice Chest No.: 30	Field Logbook No.: EL-1638	COA: BESCRC6520	Method of Shipment: FED EX	
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: FDX 793113339431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C										
Type of Container	P/G										
No. of Container(s)	1										
Volume	15mL										
SAMPLE ANALYSIS	Total Inoganic Arsenic										

Sample No.	Matrix *	Sample Date	Sample Time									
J191R1 2981-~~2~~321	OTHER SOLID	12/14/09	1200	X								

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: WENDY WEST	Date/Time: 1200 12/14/09	Received By/Stored In: EAS LOCKED STORAGE 2	Date/Time: 1200 12/14/09
Relinquished By/Removed From: EAS LOCKED STORAGE 2	Date/Time: 12/17/09 1230	Received By/Stored In: SHANNAN JOHNSON	Date/Time: 12/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	Date/Time: 12/17/09 1230	Received By/Stored In: FDX	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In: JMBrandenber	Date/Time: 12/18/09 1600
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

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-515	Page 1 of 1
Collector: WENDY WEST	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9K N; Data Turnaround: 45 Days
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: 100SA-SUCKER 3 -CARCASS	SAF No.: RC-118	ADD 71509
Ice Chest No.: 30	Field Logbook No.: EL-1638; COA: BESCRC6520	Method of Shipment: FED EX	
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: FDX 7931 1333 9431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C										
Type of Container	P/G										
No. of Container(s)	1										
Volume	15mL										
SAMPLE ANALYSIS	Total Inoganic Arsenic										
Sample No.	Matrix *	Sample Date	Sample Time								
J191R1 2981-322	OTHER SOLID	12/14/09	1330	X							

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: WENDY WEST Wendy West	1330 12/14/09	Received By/Stored In: FAS LOCKED STORAGE2 Wendy West	1330 12/14/09
Relinquished By/Removed From: FAS LOCKED STORAGE2	2/17/09 1230	Received By/Stored In: SHANNAN JOHNSON	2/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	2/17/09 1230	Received By/Stored In: FDX	
Relinquished By/Removed From		Received By/Stored In: Jim Brunden	12/18/09 1600
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-516	Page 1 of 1
Collector: WENDY WEST	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9K N; Data Turnaround: 45 Days
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: 100SA-SUCKER 4 -CARCASS	SAF No.: RC-118	1/8 71509
Ice Chest No.: 3D	Field Logbook No.: EL-1638; COA: BESCRC6520	Method of Shipment: FED EX	
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: FDX 7931133943 1	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C										
Type of Container	P/G										
No. of Container(s)	1										
Volume	15mL										
SAMPLE ANALYSIS	Total Inoganic Arsenic										

Sample No.	Matrix *	Sample Date	Sample Time									
J191R2 2981-323	OTHER SOLID	12/14/09	1430	X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: WENDY WEST	1430 12/14/09	EAS LOCKED STORAGE	1430 12/14/09
Relinquished By/Removed From: EAS LOCKED STORAGE	12/17/09 1230	SHANNAN JOHNSON	12/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	12/17/09 1230	FDX	
Relinquished By/Removed From		JM Brunken	12/18/09 1600
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-118-517	Page 1 of 1
Collector: WENDY WEST	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9K N
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: 100SA-SUCKER 5 -CARCASS		SAF No.: RC-118	Data Turnaround: 45 Days
Ice Chest No.: 30	Field Logbook No.: EL-1638	COA: BESCRC6520	Method of Shipment: FED EX	
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: FDX 793113339431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C										
Type of Container	P/G										
No. of Container(s)	1										
Volume	15mL										
SAMPLE ANALYSIS	Total Inoganic Arsenic										
Sample No.	Matrix *	Sample Date	Sample Time								
J191R3 2981-324	OTHER SOLID	12/14/09	1600	X							

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: WENDY WEST Wendy West	1600 12/14/09	FAS LOCKED STORAGE 2 Wendy West	1600 12/14/09
Relinquished By/Removed From: FAS LOCKED STORAGE 2	12/17/09 1230	SHANNAN JOHNSON	12/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	12/17/09 1230	FDX	
Relinquished By/Removed From			12/18/09 1600
Relinquished By/Removed From			
Relinquished By/Removed From			

SPECIAL INSTRUCTIONS

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-493	Page 1 of 1

Collector: WENDY WEST	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9K N	Data Turnaround: 45 Days		
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: 100SA-SUCKER1-FILLET		SAF No.: RC-118
Ice Chest No.: 310	Field Logbook No.: EL-1638	COA: BESCRC6520	Method of Shipment: FED EX
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A		Bill of Lading/Airbill No.: 7931133943 1

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C											
Type of Container	P/G											
No. of Container(s)	1											
Volume	15mL											
SAMPLE ANALYSIS	Total Inorganic Arsenic											
Sample No.	Matrix *	Sample Date	Sample Time									
J191J3 2981-325	OTHER SOLID	12/14/09	1000	X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: WENDY WEST	12/14/09 1000	EAS LOCKED STORAGE	12/14/09 1000
Relinquished By/Removed From: EAS LOCKED STORAGE2	12/17/09 1230	SHANNAN JOHNSON	12/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	12/17/09 1230	FDX	
Relinquished By/Removed From			12/18/09 1600
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-494	Page 1 of 1
Collector: WENDY WEST	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: ~~9K~~ N; Data Turnaround: 45 Days
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: 100SA-SUCKER2-FILLET	SAF No.: RC-118	
Ice Chest No.: 3D	Field Logbook No.: EL-1638; COA: BESCRC6520	Method of Shipment: FED EX	
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: 793113339431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C										
Type of Container	P/G										
No. of Container(s)	1										
Volume	15mL										
SAMPLE ANALYSIS	Total Inoganic Arsenic										
Sample No.	Matrix *	Sample Date	Sample Time								
J191J4 2981-326	OTHER SOLID	12/14/09	1130	X							

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 1130	Received By/Stored In	Date/Time 1130
WENDY WEST Wendy West	12/14/09	FAS LOCKED STORAGE Wendy West	12/14/09
Relinquished By/Removed From	Date/Time 12/17/09	Received By/Stored In	Date/Time 12/17/09
FAS LOCKED STORAGE 2	1230	SHANNAN JOHNSON	1230
Relinquished By/Removed From	Date/Time 12/17/09	Received By/Stored In	Date/Time
SHANNAN JOHNSON	1230	FDX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
		JM Brandeberry	12/18/09 1600
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

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-495	Page 1 of 1

Collector: WENDY WEST	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9K ~~N~~	Data Turnaround: 45 Days		
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: 100SA-SUCKER3-FILLET		SAF No.: RC-118
Ice Chest No.: 30	Field Logbook No.: EL-1638	COA: BESCRC6520	Method of Shipment: FED EX
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: FDX 7931 1339 431

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C											
Type of Container	P/G											
No. of Container(s)	1											
Volume	15mL											
SAMPLE ANALYSIS	Total Inoganic Arsenic											
Sample No.	Matrix *	Sample Date	Sample Time									
J191J5 2981-327	OTHER SOLID	12/14/09	1300	X								

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: WENDY WEST	Date/Time: 1300	Received By/Stored In: EAS LOCKED STORAGE 2	Date/Time: 1300 12/14/09
Relinquished By/Removed From: EAS LOCKED STORAGE 2	Date/Time: 12/17/09 1230	Received By/Stored In: SHANNAN JOHNSON	Date/Time: 12/17/09 1230
Relinquished By/Removed From: SHANNAN JOHNSON	Date/Time: 12/17/09 1230	Received By/Stored In: FDX	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In: Jim Bierdumber	Date/Time 12/18/09 1000
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

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-118-496	Page 1 of 1
Collector WENDY WEST	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9K N AJD 71409 — Data Turnaround 45 Days
Project Designation Columbia River Component of the RCBRA - Tissues	Sampling Location 100SA-SUCKER4-FILLET		SAF No. RC-118	
Ice Chest No. 3D	Field Logbook No. EL-1638	COA BESCRC6520	Method of Shipment FED EX	
Shipped To Battelle Marine Sciences	Offsite Property No. N/A		Bill of Lading/Air Bill No. FDX 793113339431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C											
Type of Container	P/G											
No. of Container(s)	1											
Volume	15mL											
SAMPLE ANALYSIS	Total Inoganic Arsenic											

Sample No.	Matrix *	Sample Date	Sample Time									
J191J6 2981-328	OTHER SOLID	12/14/09	1400	X								

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From WENDY WEST	Date/Time 1400 12/14/09	Received By/Stored In EAS LOCKED STORAGE2	Date/Time 1400 12/14/09
Relinquished By/Removed From EAS LOCKED STORAGE2	Date/Time 12/17/09 1230	Received By/Stored In SHANNAN JOHNSON	Date/Time 12/17/09 1230
Relinquished By/Removed From SHANNAN JOHNSON	Date/Time 12/17/09 1230	Received By/Stored In FDX	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time 12/18/09 1600
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

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Od
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-497	Page 1 of 1
Collector: WENDY WEST	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9K N; Data Turnaround: 45 Days
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: 100SA-SUCKER5-FILLET	SAF No.: RC-118	
Ice Chest No.: 3D	Field Logbook No.: EL-1638; COA: BESCRC6520	Method of Shipment: FED EX	
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A	Bill of Ladine/Air Bill No.: FDX 793113339431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C										
Type of Container	P/G										
No. of Container(s)	1										
Volume	15mL										
SAMPLE ANALYSIS	Total Inoganic Arsenic										
Sample No.	Matrix *	Sample Date	Sample Time								
J191J7 2981-329	OTHER SOLID	12/14/09	1530	X							

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From: WENDY WEST	Date/Time: 1530 12/14/09	Received By/Stored In: FAS LOCKED STORAGE2
Relinquished By/Removed From: FAS LOCKED STORAGE2	Date/Time: 12/17/09 1230	Received By/Stored In: SHANNAN JOHNSON
Relinquished By/Removed From: SHANNAN JOHNSON	Date/Time: 12/17/09 1230	Received By/Stored In: FDX
Relinquished By/Removed From	Date/Time	Received By/Stored In: 12/18/09 1600
Relinquished By/Removed From	Date/Time	Received By/Stored In
Relinquished By/Removed From	Date/Time	Received By/Stored In

SPECIAL INSTRUCTIONS

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

MSL Data Package Page 33 of 38

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-118-513	Page 1 of 1
Collector: WENDY WEST	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: ~~9K~~ N; Data Turnaround: 45 Days
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: 100SA-SUCKER 1 -CARCASS		SAF No.: RC-118	MD71509
Ice Chest No.: 3D	Field Logbook No.: EL-1638	COA: BESCRC6520	Method of Shipment: FED EX	
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: FDX 793113339431	

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C											
Type of Container	P/G											
No. of Container(s)	1											
Volume	15mL											
SAMPLE ANALYSIS	Total Inoganic Arsenic											
Sample No.	Matrix *	Sample Date	Sample Time									
J191P9 2981-330	OTHER SOLID	12/14/09	1030	X								

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By/Removed From: WENDY WEST Date/Time: 1030 Wendy West 12/14/09	Received By/Stored In: FAS LOCKED STORAGE2 Date/Time: 1030 Wendy West Wendy West 12/14/09		S=Soil SE=Sediment SO=Solid SI=Sludge W = Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From: FAS LOCKED STORAGE2 Date/Time: 12/17/09	Received By/Stored In: SHANNAN JOHNSON Date/Time: 12/17/09		
Relinquished By/Removed From: SHANNAN JOHNSON Date/Time: 12/17/09	Received By/Stored In: FDX Date/Time:		
Relinquished By/Removed From: Date/Time:	Received By/Stored In: [signature] Date/Time: 12/18/09 1600		
Relinquished By/Removed From: Date/Time:	Received By/Stored In: [signature] Date/Time:	Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.	
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:		

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Hanford WCH

LOG-IN CHECKLIST

Reference SOP# MSL-A-001

Central File #: 2981 Sample No(s): 309-330 Batch: 22

Project Name: Hanford WCH 121809 Project Manager: Brandenberger

TO BE COMPLETED BY PROJECT MANAGER (prior to arrival when possible)

Matrix: tissue WP#

Yes	No	
	✓	Navy-type Project (requires high-level sample tracking procedures)
	✓	USDA Samples (see Compliance Agreement Checklist)
	✓	Filter Samples: Amount: Entire sample Half of sample
✓		Freeze dry sample(s) - samples will be weighed and placed in ultralow temp freezer (Login Lab)
✓		Special instructions: split and freeze dry portion

PM Verification:

Sample Preservation Instructions:

See LIMS for archive/disposal information

TO BE COMPLETED UPON SAMPLE ARRIVAL/LOG-IN

Yes	No	N/A	Indicate in Appropriate Box
✓			Custody seal present — Seal intact? YES NO
✓			Cooler temperature (acceptable range: 4±2°C or solids:frozen) (if multiple coolers, note temp. of each) — 1.8 °C / °C
		✓	Project Manager notified of any custody/login discrepancies (cooler temp, sponsor codes, etc) Comment/Remedy:
✓			Were all chain of custody forms signed and dated?
	✓		Were samples filtered at MSL?

Sample condition(s): Acceptable Other (Explain):

Container type: Teflon Poly. Glass Cap. Vial Other:

Notes:

Completed By: JMBrenne Date/Time: 12/18/09 1600

SAMPLE PRESERVATION

	Sample(s) were preserved prior to arrival at MSL (noted on CoC / Sample / per PM Instruction)
	Random pH checked for ~10% of samples (use dip paper) Sample IDs:
	Complete pH check required for project (use pH meter and record on pH Record form)
✓	Sample(s) were preserved at MSL

Type:

	0.2% HNO3	Notes:	Lot#
	0.5% HCl (Hg samples)	Notes:	Lot#
✓	Refrigerate/Freeze	Notes:	transfered to cap vials & put in deep freeze
	Other	Notes:	

Completed By: Date/Time: 12/21/09 0700

Storage Shelf: B-1

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SAMPLE LOGIN

Project Manager: Brandenberger
Date Received: 01/28/10
Batch: 24
Login Designee: Mcgahan
Project: **Washington Closure Hanford**

Marine Sciences Laboratory
1529 West Sequim Bay Road
Sequim, Washington 98382
PH: (360) 681-4565

Sponsor ID	Site Description	Battelle Code	Matrix	Storage Location	Requested Parameters	Collection Date
J19249	na	2981-336	other solid	Deep Freezer C-1	Total Inorganic As	01/21/10
J19680	na	2981-337	other solid	Deep Freezer C-1	Total Inorganic As	01/21/10
J19H16	na	2981-338	other solid	Deep Freezer C-1	AVS-SEM-SULFIDES; AVS-SEM-METALS (Cadmium, Copper,Lead,Nickel,Zinc)	01/18/10
J19H31	na	2981-339	other solid	Deep Freezer C-1	AVS-SEM-SULFIDES; AVS-SEM-METALS (Cadmium, Copper,Lead,Nickel,Zinc)	01/25/10
J19FD3	na	2981-340	other solid	Deep Freezer C-1	AVS-SEM-SULFIDES; AVS-SEM-METALS (Cadmium, Copper,Lead,Nickel,Zinc)	01/25/10
J19HV9	na	2981-341	other solid	Deep Freezer C-1	AVS-SEM-SULFIDES; AVS-SEM-METALS (Cadmium, Copper,Lead,Nickel,Zinc)	01/22/10
J19HW0	na	2981-342	other solid	Deep Freezer C-1	AVS-SEM-SULFIDES; AVS-SEM-METALS (Cadmium, Copper,Lead,Nickel,Zinc)	01/23/10
J19HV8	na	2981-343	other solid	Deep Freezer C-1	AVS-SEM-SULFIDES; AVS-SEM-METALS (Cadmium, Copper,Lead,Nickel,Zinc)	01/24/10
J19FJ6	na	2981-344	other solid	Deep Freezer C-1	AVS-SEM-SULFIDES; AVS-SEM-METALS (Cadmium, Copper,Lead,Nickel,Zinc)	01/24/10
J19FB5	na	2981-345	other solid	Deep Freezer C-1	AVS-SEM-SULFIDES; AVS-SEM-METALS (Cadmium, Copper,Lead,Nickel,Zinc)	01/25/10
J19FJ7	na	2981-346	other solid	Deep Freezer C-1	AVS-SEM-SULFIDES; AVS-SEM-METALS (Cadmium, Copper,Lead,Nickel,Zinc)	01/24/10

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-601	Page 1 of 1

Collector: M. Fidino	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: ~~9K~~ N	Data Turnaround: 45 Days		
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: URSA-CARP 4 FILLET		SAF No.: RC-118
HA 72089			
Ice Chest No.: WCH-08-0012	Field Logbook No.: EL-1638 -1	COA: BESCRC6520	Method of Shipment: FED EX
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: 7932 1884 5056

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C											
Type of Container	P/G											
No. of Container(s)	1											
Volume	15mL											
SAMPLE ANALYSIS	Total Inoganic Arsenic											
Sample No.	Matrix *	Sample Date	Sample Time									
J19249 2891, 336	OTHER SOLID	1/21/10	1130	X								

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: M. Fidino on 2	Date/Time: 1/21/10 1130	Received By/Stored In: EAS LOCKED STORAGE #2 1/21/10 on 2	Date/Time: 1/21/10 1130
Relinquished By/Removed From: EAS LOCKED STORAGE #2	Date/Time: 1/27/10 1245	Received By/Stored In: SHANNAN JOHNSON	Date/Time: 1/27/10 1245
Relinquished By/Removed From: SHANNAN JOHNSON	Date/Time: 1/27/10 1245	Received By/Stored In: FOX	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time: 01/28/09 1300
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

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-118-949	Page 1 of 1

Collector: M. Fidino	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9K N	Data Turnaround: 45 Days		
Project Designation: Columbia River Component of the RCBRA - Tissues	Sampling Location: URSA-CARP 4 CARCASS		SAF No.: RC-118
Ice Chest No.: WCH-08-001-2	Field Logbook No.: EL-1638-1	COA: BESCRC6520	Method of Shipment: FED EX
Shipped To: Battelle Marine Sciences	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: 7932 1884 5056

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

FREEZE "MATRIX COMPOSED OF FISH"

Preservation	Cool 4C											
Type of Container	P/G											
No. of Container(s)	1											
Volume	15mL											
SAMPLE ANALYSIS	Total Inoganic Arsenic											
Sample No.	Matrix *	Sample Date	Sample Time									
J19680 2981 337	OTHER SOLID	1/21/10	1330	X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: M. Fidino	1/21/10 1330	Received By/Stored In: EAS LOCKED STORAGE #4	1/21/10 1330
Relinquished By/Removed From: EAS LOCKED STORAGE #4	1/27/10 1245	Received By/Stored In: SHANNAN JOHNSON	1/27/10 1245
Relinquished By/Removed From: [illegible]	1/27/10 1245	Received By/Stored In: FOX	
Relinquished By/Removed From		Received By/Stored In: [illegible]	04/25/07 1300
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

Matrix *

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

LOG-IN CHECKLIST

Reference SOP# MSL-A-001

Central File #: 2981 Sample No(s): 336-346 Batch: 25

Project Name: WA Closure Hanford Project Manager: Brandenberger

TO BE COMPLETED BY PROJECT MANAGER (prior to arrival when possible)

Matrix: _____ WP# _____

Yes	No	
		Navy-type Project (requires high-level sample tracking procedures)
		USDA Samples (see Compliance Agreement Checklist) — PM Verification:
		Filter Samples: Amount: Entire sample / Half of sample
		Freeze dry sample(s) - samples will be weighed and placed in ultralow temp freezer (Login Lab)
		Special instructions:

Sample Preservation Instructions:

See LIMS for archive/disposal information

TO BE COMPLETED UPON SAMPLE ARRIVAL/LOG-IN

Yes	No	N/A	Indicate in Appropriate Box
	N/A		Custody seal present — Seal intact? YES NO
N/A			Cooler temperature (acceptable range: 4±2°C or solids:frozen) (if multiple coolers, note temp. of each) — 2.9 °C; °C
		N/A	Project Manager notified of any custody/login discrepancies (cooler temp, sponsor codes, etc) Comment/Remedy:
N/A			Were all chain of custody forms signed and dated?
	N/A		Were samples filtered at MSL?

Sample condition(s): Acceptable / Other (explain):

Container type: Teflon / Poly / Other / Cap. Vial / Other:

Notes:

Completed By: [signature] Date/Time: 01/28/08 1300

SAMPLE PRESERVATION

- [ ] Sample(s) were preserved prior to arrival at MSL (noted on CoC / Sample / per PM Instruction)
- [ ] Random pH checked for ~10% of samples (use dip paper) Sample IDs:
- [ ] Complete pH check required for project (use pH meter and record on pH Record form)
- [N/A] Sample(s) were preserved at MSL

Type:			Notes:	Lot#
		0.2% HNO3		
		0.5% HCl (Hg samples)		
	N/A	Refrigerate/Freeze	deep freeze C-1	
		Other		

Completed By: [signature] Date/Time: 01/28/08 1300

Storage Shelf: