

SOUTHWEST RESEARCH INSTITUTE®

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CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY



December 28, 2017

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

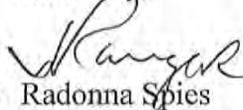
Attn: Ms. Karen Waters-Husted

Subject:	SAF No:	S18-011, W18-012
	SDG Number:	624984
	SwRI Project Number:	20859.01.00X
	SwRI Task Order Number:	171212-4
	SwRI Sample Receipt Number:	60874
	Samples Received:	12.12.2017
	Fraction:	Cyanide Analyses

Dear Ms. Waters-Husted:

Please find the enclosed results for the thirteen (13) overall water samples received on the above referenced date. If you should have any questions, please do not hesitate to call me at (210) 522-3242, or at radonna.spies@swri.org.

Sincerely,

for 
Radonna Spies
Principal Scientist

APPROVED:


Michael J. Dammann
Director

RPS: jz
Encl



Benefiting government, industry and the public through innovative science and technology

010001

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation Company
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 171212-4
SwRI SRR: 60874
SDG: 624984
VTSR: 12.12.2017

Chain-of-Custody
&
Sample Receipt Paperwork

Total Page Count: 010001
Fraction Cyanide Pages: 010009
Analyses

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			010002 C.O.C.# S18-011-838 Page 1 of 2			
Collector: Juan Aguilar /CHPRC		Contact/Requester: Karen Waters-Husted		Telephone No.: 509-376-4650				
SAF No.: S18-011		Sampling Origin: Hanford Site		Purchase Order/Charge Code: 300071				
Project Title: SURV, NOVEMBER 2017		Logbook No.: HNF-N-506 - 96/68		Ice Chest No.: GWS-394				
Shipped To (Lab): Southwest Research Institute		Method of Shipment: Commercial Carrier		Bill of Lading/Air Bill No.: 770955808TB				
Protocol: SURV		Priority: 15 ³⁰ Days		Offsite Property No.: 8839				
POSSIBLE SAMPLE HAZARDS/REMARK ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1			SPECIAL INSTRUCTIONS N/A					
KS 12/6/17								
Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FD12	N	W	12-7-17	1004	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC SRR # 60874
 SDG # 624984
 SwRI Prjct # 20859.01.00X
 TO: 171212-4

Relinquished By: Juan Aguilar /CHPRC Print First and Last Name Signature: <i>[Signature]</i> Date/Time: DEC 07 2017 1152	Received By: MIKE ESPARZA Print First and Last Name Signature: <i>[Signature]</i> Date/Time: DEC 07 2017 1152	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other			
Relinquished By: MIKE ESPARZA /CHPRC Print First and Last Name Signature: <i>[Signature]</i> Date/Time: DEC 07 2017 1205	Received By: SSU-1 Print First and Last Name Signature: <i>[Signature]</i> Date/Time: DEC 07 2017 1205				
Relinquished By: SSU-1 Print First and Last Name Signature: <i>[Signature]</i> Date/Time: DEC 11 2017 0800	Received By: Troy Bacon /CHPRC Print First and Last Name Signature: <i>[Signature]</i> Date/Time: DEC 11 2017 0800				
Relinquished By: Troy Bacon /CHPRC Print First and Last Name Signature: <i>[Signature]</i> Date/Time: DEC 11 2017 1400	Received By: FEDEX Print First and Last Name Signature: <i>[Signature]</i> Date/Time:				
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By:	Date/Time:

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		010004 C.O.C.# W18-012-054 Page 1 of 1
Collector: Juan Aguilar CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650 <i>tbl 12-17</i>		
SAF No.: W18-012	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071		
Project Title: RCRA, DECEMBER 2017	Logbook No.: HNF-N-506 - 96/69	Ice Chest No.: GWS-394		
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 7709 5580 815		
Protocol: RCRA	Priority: 15 Days PRIORITY	Offsite Property No.: 8839		

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

SPECIAL INSTRUCTIONS
 N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FJY0	Y	W	12-8-17	0805	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3FJX6	N	W	12-8-17	0805	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC SRR # 60874
 SDG # 624984
 SwRi Prjct # 20859.01.00X
 TO: 171212-4

Relinquished By: Juan Aguilar CHPRC Print First and Last Name: Juan Aguilar Signature: <i>[Signature]</i> Date/Time: DEC 08 2017 1033	Received By: Chris Fulton CHPRC Print First and Last Name: Chris Fulton Signature: <i>[Signature]</i> Date/Time: DEC 08 2017 1033	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other	
Relinquished By: Chris Fulton CHPRC Print First and Last Name: Chris Fulton Signature: <i>[Signature]</i> Date/Time: DEC 08 2017 1130	Received By: SSU-1 Print First and Last Name: SSU-1 Signature: <i>[Signature]</i> Date/Time: DEC 08 2017 1130		
Relinquished By: SSU-1 Print First and Last Name: SSU-1 Signature: <i>[Signature]</i> Date/Time: DEC 11 2017 0800	Received By: Troy Bacon CHPRC Print First and Last Name: Troy Bacon Signature: <i>[Signature]</i> Date/Time: DEC 11 2017 0800		
Relinquished By: Troy Bacon CHPRC Print First and Last Name: Troy Bacon Signature: <i>[Signature]</i> Date/Time: DEC 11 2017 1400	Received By: FEDEX Print First and Last Name: FEDEX Signature: <i>[Signature]</i> Date/Time:		
FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By:	Date/Time:

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	010006	C.O.C.# W18-012-056
			Page 1 of 1

Collector: Juan Aguilar /CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-012	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, DECEMBER 2017	Logbook No.: HNF-N-506-96170	Ice Chest No.: GWS-394
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 7709 5580 875
Protocol: RCRA	Priority: 15 Days PRIORITY	Offsite Property No.: 8839

POSSIBLE SAMPLE HAZARDS/REMARK ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1	SPECIAL INSTRUCTIONS N/A
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FJY5	N	W	12-8-17	1238	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3FJY8	Y	W	12-8-17	1238	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
 SRR # 60874
 SDG # 624984

SwRI Prjct # 20859.01.00Y
 TO: 171212-4

SWRI

Relinquished By: Juan Aguilar /CHPRC Print First and Last Name Signature Date/Time	Received By: SSU-1 Print First and Last Name Signature Date/Time	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: SSU-1 Print First and Last Name Signature Date/Time	Received By: Troy Bacon /CHPRC Print First and Last Name Signature Date/Time	
Relinquished By: Troy Bacon /CHPRC Print First and Last Name Signature Date/Time	Received By: FEDEX Print First and Last Name Signature Date/Time	
Relinquished By: FED EX Print First and Last Name Signature Date/Time	Received By: David Garcia Print First and Last Name Signature Date/Time	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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CH2M Hill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	010007 C.O.C.# W18-012-064
Page 1 of 1		

Collector: Juan Aguilar /CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-012	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, DECEMBER 2017	Logbook No.: HNF-N-506 -96/69	Ice Chest No.: GWS-394
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 7709 5580875
Protocol: RCRA	Priority: 15 Days PRIORITY	Offsite Property No.: 8839

POSSIBLE SAMPLE HAZARDS/REMARK ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1	SPECIAL INSTRUCTIONS N/A
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FK74	N	W	12-8-17	1144	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3FK78	Y	W	12-8-17	1144	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
 SRR # 60874
 SDG # 624984
 SwRI Prjct # 20859.01.00X
 TO: 171212-4
SWRI

Relinquished By: Juan Aguilar /CHPRC Print First and Last Name Signature Date/Time DEC 08 2017 1405	Received By: SSU 1 Print First and Last Name Signature Date/Time DEC 08 2017 1405	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: SSU-1 Print First and Last Name Signature Date/Time DEC 11 2017 0800	Received By: Troy Bacon /CHPRC Print First and Last Name Signature Date/Time DEC 11 2017 0800	
Relinquished By: Troy Bacon /CHPRC Print First and Last Name Signature Date/Time DEC 11 2017 1400	Received By: FEDEX Print First and Last Name Signature Date/Time	
Relinquished By: FEDEX Print First and Last Name Signature Date/Time	Received By: David Garcia Print First and Last Name Signature Date/Time 12-12-2017 08:30	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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CH2M Hill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	010008	C.O.C.# W18-012-195
			Page 1 of 1

Collector: Juan Aguilar /CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-012	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, DECEMBER 2017	Logbook No.: HNF-N-506-96/69	Ice Chest No.: GWS-394
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 7109 5580 875
Protocol: RCRA	Priority: 15 Days PRIORITY	Offsite Property No.: 8839

POSSIBLE SAMPLE HAZARDS/REMARK ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1	SPECIAL INSTRUCTIONS N/A
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FM49	N	W	12-8-17	1309	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CN (AMENABLE): COMMON; 9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3FKJ7	Y	W	12-8-17	1309	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CN (AMENABLE): COMMON; 9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC SRR # 60874
 SDG # 624984
 SwRI Prjct # 20859.01.00X
 TO: 171212-4

Relinquished By: <u>Juan Aguilar</u> /CHPRC Print First and Last Name Signature Date/Time	Received By: <u>SSU 1</u> Print First and Last Name Signature Date/Time	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: <u>SSU-1</u> Print First and Last Name Signature Date/Time	Received By: <u>Troy Bacon</u> /CHPRC Print First and Last Name Signature Date/Time	
Relinquished By: <u>Troy Bacon</u> /CHPRC Print First and Last Name Signature Date/Time	Received By: <u>FEDEX</u> Print First and Last Name Signature Date/Time	
Relinquished By: <u>FEDEX</u> Print First and Last Name Signature Date/Time	Received By: <u>David Garcia</u> Print First and Last Name Signature Date/Time	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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CH2M Hill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	010009 C.O.C.# W18-012-196 Page 1 of 1
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Collector: Juan Aguilar /CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-012	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, DECEMBER 2017	Logbook No.: HNF-N-506 -96/69	Ice Chest No.: GWS-394
Shipped To (Lab): Southwest Research Institute	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No.: 7109 5580 875
Protocol RCRA	Priority: 15 Days PRIORITY	Offsite Property No.: 8839

POSSIBLE SAMPLE HAZARDS/REMARK ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1	SPECIAL INSTRUCTIONS N/A
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FKJ6	Y	W	12-8-17	1309	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CN (AMENABLE): COMMON; 9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3FM48	N	W	12-8-17	1309	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CN (AMENABLE): COMMON; 9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
 SRR # 60874
 SDG # 624984
 SwRI Prjct # 20859.01.00X
 TO: 171212-4

Relinquished By: Juan Aguilar /CHPRC Print First and Last Name Signature Date/Time: DEC 08 2017 1405	Received By: SSU1 Print First and Last Name Signature Date/Time: DEC 08 2017 1405	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: SSU-1 Print First and Last Name Signature Date/Time: DEC 11 2017 0800	Received By: Troy L. Bacon /CHPRC Print First and Last Name Signature Date/Time: DEC 11 2017 0800	
Relinquished By: Troy L. Bacon /CHPRC Print First and Last Name Signature Date/Time: DEC 11 2017 1400	Received By: FEDEX Print First and Last Name Signature Date/Time:	
Relinquished By: FEDEX Print First and Last Name Signature Date/Time:	Received By: David Garcia /CHPRC Print First and Last Name Signature Date/Time: 12-12-2017 08:30	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		010010 C.O.C.# W18-012-197 Page 1 of 1
Collector: Juan Aguilar CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650		
SAF No.: W18-012	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071		
Project Title: RCRA, DECEMBER 2017	Logbook No.: HNF-N-506 - 96/69	Ice Chest No.: GWS-394		
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 7709 5580 875		
Protocol: RCRA	Priority: 15 Days PRIORITY	Offsite Property No.: 8839		

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

SPECIAL INSTRUCTIONS
 N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FM50	Y	W	12-8-17	1057	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CN (AMENABLE): COMMON; 9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3FM79	N	W	12-8-17	1057	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CN (AMENABLE): COMMON; 9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC SRR # 60874
 SDG # 624984
 SwRI Prjct # 20859.01.00X
 TO: 171212-4

Relinquished By: Juan Aguilar CHPRC Print First and Last Name Signature Date/Time DEC 08 2017 1405	Received By: SSU-1 Print First and Last Name Signature Date/Time DEC 08 2017 1405	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other	
Relinquished By: SSU-1 Print First and Last Name Signature Date/Time DEC 11 2017 0800	Received By: Troy Bacon CHPRC Print First and Last Name Signature Date/Time DEC 11 2017 0800		
Relinquished By: Troy Bacon CHPRC Print First and Last Name Signature Date/Time DEC 11 2017 1400	Received By: FEDEX Print First and Last Name Signature Date/Time		
Relinquished By: FEDEX Print First and Last Name Signature Date/Time	Received By: David Garcia Print First and Last Name Signature Date/Time 12-12-2017 08:30		
FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By:	Date/Time:

010011

Southwest Research Institute

Laboratory Task Order

TO #: 171212-4 Revision: 0

Project(s): 20859.01.00X
 Manager(s): SPIES, RADONNA
 To Client: 12/26/17

SDG: 624984
 VTSR: 12/12/17
 SAF: S18-011 W18-012

SRR #'s: 60874
 Client(s): CH2M Hill Plateau Remediation Company

Instructions

CH2MHill Plateau Remediation Company. 300071
 SAF No. S18-011
 SAF No. W18-012

SDG 624984 is closed

15-day TAT.
 FINAL DATA/HARDCOPY IS DUE TO THE CLIENT ON 12/27/2017.

17 overall samples (21 containers) were received on 12/12/2017.
 OUT of the 17 samples, ONLY the 13 samples that required Cn, are listed here.

NOTE _ Sample B3FD12 only requires 9014 Cn and 9012 Cn. NO Amenable.

Sample Analysis REQUIRED
 9012 _ 57-12-5 Cyanide (Total)
 9012 _ CATC Cyanide (Amenable)
 9014 _ FREE-CN Cyanide (Free)

DATA DELIVERABLE _ Summary (Narrative / Results only)
 REQUESTER _ Karen Waters-Rusted

ATTACHMENT C - QC Requirements for Chemical and Radiochemical Analysis
 Section 7.2.2 Sample Data Packages
 Section 7.2.3 Hard Copy Deliverable format
 Section 7.2.4 Final Data Package Requirements
 Section 8.8 CHPRC Electronic Address

Electronic copies of all sample receipt information, COCs, priority data packages, final data packages, corrected/revised data packages, closure reports, status reports, invoices, etc. shall be sent to: mailto:^CPP_Sample_Management@rl.gov

Documents Related to this task order: 234288[COC for SRR 60874], 234289[Paperwork for SRR 60874]

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

Test: AMENCN_9012
 Section: WETCHEM

Holding: 14 days from CED

Amenable Cyanide by SW846 9012

Cnt: 12

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
624985		1	Water	B3FJX6	08 Dec 17	22 Dec 17
624986		1	Water	B3FJY0	08 Dec 17	22 Dec 17
624987		1	Water	B3FJY5	08 Dec 17	22 Dec 17
624988		1	Water	B3FJY8	08 Dec 17	22 Dec 17
624989		1	Water	B3FK74	08 Dec 17	22 Dec 17
624990		1	Water	B3FK78	08 Dec 17	22 Dec 17
624992		1	Water	B3FKJ6	08 Dec 17	22 Dec 17
624993		1	Water	B3FKJ7	08 Dec 17	22 Dec 17
624994		1	Water	B3FM48	08 Dec 17	22 Dec 17
624995		1	Water	B3FM49	08 Dec 17	22 Dec 17
624996		1	Water	B3FM50	08 Dec 17	22 Dec 17
624997		1	Water	B3FM79	08 Dec 17	22 Dec 17

Test: CN_9012
 Section: WETCHEM

Holding: 14 days from CED

Cyanide by Method 9012 (Automated)

Cnt: 13

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
624984	note	1	Water	B3FD12	07 Dec 17	21 Dec 17



010012

Southwest Research Institute

Laboratory Task Order

TO #: 171212-4 Revision: 0

Project(s): 20859.01.00X
 Manager(s): SPIES, RADONNA
 To Client: 12/26/17

SDG: 624984
 VTSR: 12/12/17
 SAF: S18-011 W18-012

SRR #'s: 60874
 Client(s): CH2M Hill Plateau Remediation Company

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
624985		1	Water	B3FJX6	08 Dec 17	22 Dec 17
624986		1	Water	B3FJY0	08 Dec 17	22 Dec 17
624987		1	Water	B3FJY5	08 Dec 17	22 Dec 17
624988		1	Water	B3FJY8	08 Dec 17	22 Dec 17
624989		1	Water	B3FK74	08 Dec 17	22 Dec 17
624990		1	Water	B3FK78	08 Dec 17	22 Dec 17
624992		1	Water	B3FKJ6	08 Dec 17	22 Dec 17
624993		1	Water	B3FKJ7	08 Dec 17	22 Dec 17
624994		1	Water	B3FM48	08 Dec 17	22 Dec 17
624995		1	Water	B3FM49	08 Dec 17	22 Dec 17
624996		1	Water	B3FM50	08 Dec 17	22 Dec 17
624997		1	Water	B3FM79	08 Dec 17	22 Dec 17

Test: CN_9014
 Section: WETCHEM

Holding: 14 days from CED

Total Cyanide by SW846 9014

Cnt: 13

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
624984	note	1	Water	B3FD12	07 Dec 17	21 Dec 17
624985		1	Water	B3FJX6	08 Dec 17	22 Dec 17
624986		1	Water	B3FJY0	08 Dec 17	22 Dec 17
624987		1	Water	B3FJY5	08 Dec 17	22 Dec 17
624988		1	Water	B3FJY8	08 Dec 17	22 Dec 17
624989		1	Water	B3FK74	08 Dec 17	22 Dec 17
624990		1	Water	B3FK78	08 Dec 17	22 Dec 17
624992		1	Water	B3FKJ6	08 Dec 17	22 Dec 17
624993		1	Water	B3FKJ7	08 Dec 17	22 Dec 17
624994		1	Water	B3FM48	08 Dec 17	22 Dec 17
624995		1	Water	B3FM49	08 Dec 17	22 Dec 17
624996		1	Water	B3FM50	08 Dec 17	22 Dec 17
624997		1	Water	B3FM79	08 Dec 17	22 Dec 17



010013

Sample Receipt

Southwest Research Institute

Sample Receipt Number: 60874
Revision: 2

VTSR: 12/12/17

Time: 08:30:00

Project: 20859.01.00X

Case #: CHPRC

Client: CH2M Hill Plateau Remediation Company

This Receipt was Revised 12/28/2017

Manager: SPIES, RADONNA

Logged in by: DXGARCIA

Creation Date: 12/12/17

Notes

Samples were received intact.

Fed Ex tracking #:

7709 5580 8775 _ 2.0°C (wet ice)

7709 6163 2666 _ 2.0°C (wet ice)

Ice Chest No:

GWS-394

GWS-600

pH Test Paper 0.0 to 3.0

Lot - 230315

Exp: 10/30/2018

pH Test Paper 0.0 to 13.0

Lot - 230016 _ Inventory # 83485

Exp: 10/30/2019

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

Test requirements located on Task Order.

REVISION 1, DRmz 12/27/17: SRR revised to clarify times.

REVISION 2, DG 12/28/17: Corrected COC records.

Background CPM: <150cpm
Container Wide CPM: <150cpm
Total CPM: <150

System ID	Customer ID	CED	Matrix	Containers	Special Reqs.
624981	B3D7C2	12/07/17	Water	1	
624982	B3D7D8	12/07/17	Water	1	
624983	B3D9J0	12/07/17	Water	2	
624984	B3FD12	12/07/17	Water	1	
624985	B3FJX6	12/08/17	Water	1	
624986	B3FJY0	12/08/17	Water	1	
624987	B3FJY5	12/08/17	Water	1	
624988	B3FJY8	12/08/17	Water	1	
624989	B3FK74	12/08/17	Water	1	
624990	B3FK78	12/08/17	Water	1	
624991	B3FKF0	12/11/17	Water	4	
624992	B3FKJ6	12/08/17	Water	1	
624993	B3FKJ7	12/08/17	Water	1	
624994	B3FM48	12/08/17	Water	1	
624995	B3FM49	12/08/17	Water	1	
624996	B3FM50	12/08/17	Water	1	
624997	B3FM79	12/08/17	Water	1	

Containers: 21

Samples: 17

60874 CH2M Hill Plateau Remediation

010014

Sample Receipt

Southwest Research Institute

Sample Receipt Number: 60874
Revision: 2

VTSR: 12/12/17

Time: 08:30:00

Project: 20859.01.00X

Case #: CHPRC

Client: CH2M Hill Plateau Remediation Company

This Receipt was Revised 12/28/2017

Manager: SPIES, RADONNA

Logged in by: DXGARCIA

Creation Date: 12/12/17

These documents are associated with this receipt: 234288[COC for SRR 60874], 234289[Paperwork for SRR 60874]

Thermometer: 021056
Temperature: 2.0

60874 CH2M Hill Plateau Remediation

010015

Southwest Research Institute
Traffic Report

Sample Custodian Signature: David Garcia



- 1. Custody Seal Present
- 2. Chain of Custody Present
- 3. Sample Tags Not Present
Sample Tag Numbers Not on COC *N/A*
- 4. SMO Forms Present

Client: CH2M Hill Plateau Remediation Company
 Project: 20859.01.00X
 Case: CHPRC / SDG: SEE TO
 Sample Receipt: 60874
 Airbill: 770955808775,770961632666

Custody Seal #(s): N/A

Date Received	Time Received	COC Record	SMO Sample #	Corresponding		Traffic Rpt, Tags, COC Agree	Sample Condition
				Sample Tag #	SwRI #		
12/12/17	08:30:00	S18-010-542	B3D7C2	N/A	624981	YES	Intact
12/12/17	08:30:00	S18-010-549	B3D7D8	N/A	624982	YES	Intact
12/12/17	08:30:00	S18-010-721	B3D9J0	N/A	624983	YES	Intact
12/12/17	08:30:00	S18-011-838	B3FD12	N/A	624984	YES	Intact
12/12/17	08:30:00	W18-012-054	B3FJX6	N/A	624985	YES	Intact
12/12/17	08:30:00	W18-012-054	B3FJY0	N/A	624986	YES	Intact
12/12/17	08:30:00	W18-012-056	B3FJY5	N/A	624987	YES	Intact
12/12/17	08:30:00	W18-012-056	B3FJY8	N/A	624988	YES	Intact
12/12/17	08:30:00	W18-012-064	B3FK74	N/A	624989	YES	Intact
12/12/17	08:30:00	W18-012-064	B3FK78	N/A	624990	YES	Intact
12/12/17	08:30:00	W18-012-104	B3FKF0	N/A	624991	YES	Intact
12/12/17	08:30:00	W18-012-196	B3FKJ6	N/A	624992	YES	Intact
12/12/17	08:30:00	W18-012-195	B3FKJ7	N/A	624993	YES	Intact
12/12/17	08:30:00	W18-012-196	B3FM48	N/A	624994	YES	Intact
12/12/17	08:30:00	W18-012-195	B3FM49	N/A	624995	YES	Intact
12/12/17	08:30:00	W18-012-197	B3FM50	N/A	624996	YES	Intact
12/12/17	08:30:00	W18-012-197	B3FM79	N/A	624997	YES	Intact

010016

SAMPLE LOG-IN SHEET

Lab Name Southwest Research Institute		Page 1 of 1	
Received By (Print Name) DAVID GARCIA		Log-in Date 12/12/2017	
Received By (Signature) <i>David Garcia</i>			
Case Number CHPRC	Sample Delivery Group No. N/A		SAS Number N/A
Remarks: 20859.01.00X			
		Corresponding	
	EPA Sample #	Sample Tag #	Assigned Lab #
1. Custody Seal(s)	Present / Absent* Intact / Broken	B3D7C2	N/A
		B3D7D8	N/A
2. Custody Seal Nos.	N/A	B3D9J0	N/A
		B3FD12	N/A
3. Chain-of Custody Records	Present / Absent*	B3FJX6	N/A
4. Traffic Reports or Packing Lists	Present / Absent*	B3FJY0	N/A
5. Airbill	Airbill / Sticker Present / Absent*	B3FJY5	N/A
		B3FJY8	N/A
6. Airbill No.	770955808775, 77096163 2666	B3FK74	N/A
		B3FK78	N/A
7. Sample Tags	Present Absent N/A	B3FKF0	N/A
Sample Tag Numbers	Listed Not listed on Chain of Custody	B3FKJ6	N/A
8. Sample Condition	Intact / Broken* / Leaking	B3FKJ7	N/A
9. Cooler Temperature	2.0C	B3FM48	N/A
		B3FM49	N/A
10. Does Information on custody records, traffic reports, and sample tags agree?	Yes / No*	B3FM50	N/A
		B3FM79	N/A
11. Date Received at Lab	12/12/2017		
12. Time Received	08:30:00		
Sample Transfer			
Fraction <i>Area & Tn ORG</i>	Fraction		
Area # <i>R90 & 13</i>	Area #		
By DAVID GARCIA	By		
On 12/12/2017	On		

* Contact SMO and attach record of resolution

Reviewed By <i>J. Lopez</i>	Logbook No.	Sample Receipt (60874)
Date 12.28.17	Logbook Page No.	10032

010017**SOUTHWEST RESEARCH INSTITUTE****CLIENT: CH2M Hill Plateau Remediation Company****SwRI PROJECT#: 20859.01.00X****SwRI TASK ORDER: 171212-4****SwRI SRR: 60874****SDG: 624984****VTSR: 12.12.2017****pH Report**

SwRI

pH Preservation Report

010018

Sample Receipt: 60874

Customer: CH2M Hill Plateau Remediation

Project: 20859.01.00X

Case: CHPRC

Received: 12/12/2017

Samples Logged in by: DXGARCIA

SwRI #	Customer ID	Container ID	Initial pH	Login			Lab				
				Adjustment	Final pH	Paper Lot	Adjustment	Final pH	Paper lot	Adjusted	Lab Staff ID
624981 1	B3D7C2										
624982 1	B3D7D8										
624983 1	B3D9J0	SRISO	<2								
624983 2	B3D9J0	TRITIUM									
624984 1	B3FD12		>=12								
624985 1	B3FJX6		>=12								
624986 1	B3FJY0		>=12								
624987 1	B3FJY5		>=12								
624988 1	B3FJY8		>=12								
624989 1	B3FK74		>=12								
624990 1	B3FK78		>=12								
624991 1	B3FKF0										
624991 2	B3FKF0										
624991 3	B3FKF0										
624991 4	B3FKF0										
624992 1	B3FKJ6		>=12								
624993 1	B3FKJ7		>=12								
624994 1	B3FM48		>=12								
624995 1	B3FM49		>=12								
624996 1	B3FM50		>=12								
624997 1	B3FM79		>=12								

010019

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation Company
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 171212-4
SwRI SRR: 60874
SDG: 624984
VTSR: 12.12.2017

Case Narrative

010020**CLIENT: CH2M Hill Plateau Remediation Company****SDG: 624984****SwRI Project Number: 20859.01.00X****SwRI Sample Receipt Number: 60874****Page#: 1**

SwRI CASE NARRATIVE

1. Thirteen (13) samples were received for Cyanide Analyses :

SwRI ID	Customer ID	Matrix
624984	B3FD12	Water
624985	B3FJX6	Water
624986	B3FJY0	Water
624987	B3FJY5	Water
624988	B3FJY8	Water
624989	B3FK74	Water
624990	B3FK78	Water
624992	B3FKJ6	Water
624993	B3FKJ7	Water
624994	B3FM48	Water
624995	B3FM49	Water
624996	B3FM50	Water
624997	B3FM79	Water

010021

Client: CH2M Hill Plateau Remediation Company
SDG: 624984
SwRI Project Number: 20859.01.00X
SwRI Task Order Number(s): 171212-4

WETCHEM ANALYSIS

The following analyses were performed for this sample delivery group (SDG):

Total Cyanide – SW-846 Method 9012
Amenable Cyanide – SW-846 Method 9012
Free Cyanide – SW-846 Method 9014

Holding Times:

All holding times were met.

Cyanide:

All PBs, ICB's and CCB's were less than the reporting limit. All LCSWs were within 80-120% recovery and all ICV's and CCV's were within 90-110% recovery. The method states 90-110% recovery criteria for LCSH and LCSL; all were within their specified criteria. All LLCs were within 50-150% recovery and all duplicates were less than 20% recovery. If the method did not specify MS recovery criteria, then 75-125% was used. All matrix spike recoveries were within their specified criteria with the exception of free cyanide with 11.2% recovery (SwRI#624997) and 66.4% (SwRI#624985), which can be due to the sample containing one or more of the metals that form the metal cyanide complex.

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



Manager

12/27/17

Date

010022

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation Company
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 171212-4
SwRI SRR: 60874
SDG: 624984
VTSR: 12.12.2017

SW-846 Method 9012 & 9014 Results

SOUTHWEST RESEARCH INSTITUTE **010023**
WetChem Report
Cover Page

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4

SDG: 624984
SRR: 60874

Case: CHPRC
Project: 20859.01.00X

Client Sample ID	Lab Sample ID
B3FD12	624984
B3FJX6	624985
B3FJX6D	624985D
B3FJY0	624986
B3FJY5	624987
B3FJY8	624988
B3FK74	624989
B3FK78	624990
B3FKJ6	624992
B3FKJ7	624993
B3FM48	624994
B3FM49	624995
B3FM50	624996
B3FM79	624997
B3FM79D	624997D

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and the electronic data submitted has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: 
Date: 12/27/17

Name: Radonna Spies
Title: Principal Scientist

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I
Certificate of Analysis

010024 Client Sample ID

B3FD12

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624984
Result Units: mg/L

SDG: 624984
SRR: 60874
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X
Receipt Date: 12/12/2017
Collection Date: 12/07/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
57-12-5	Free Cyanide	0.0356	X	KNO	0.00500	1	NA	12/19/2017 15:09
57-12-5	Total Cyanide	0.685	D	KNO	0.0100	2	20171218-P001	12/18/2017 18:15

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

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SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I

010025 Client Sample ID

B3FJX6

Certificate of Analysis

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624985
Result Units: mg/LSDG: 624984
SRR: 60874
Matrix: Water
% Solids: NACase: CHPRC
Project: 20859.01.00X
Receipt Date: 12/12/2017
Collection Date: 12/08/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 16:52
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	12/19/2017 16:17
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 15:50

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I

010026 Client Sample ID

B3FJY0

Certificate of Analysis

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624986
Result Units: mg/LSDG: 624984
SRR: 60874
Matrix: Water
% Solids: NACase: CHPRC
Project: 20859.01.00X
Receipt Date: 12/12/2017
Collection Date: 12/08/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 16:52
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	12/19/2017 15:45
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 15:50

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

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SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I

010027 Client Sample ID

B3FJY5

Certificate of Analysis

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624987
Result Units: mg/LSDG: 624984
SRR: 60874
Matrix: Water
% Solids: NACase: CHPRC
Project: 20859.01.00X
Receipt Date: 12/12/2017
Collection Date: 12/08/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00625		KNO	0.00500	1	20171218-P001	12/18/2017 17:27
57-12-5	Free Cyanide	0.00528	X	KNO	0.00500	1	NA	12/19/2017 14:39
57-12-5	Total Cyanide	0.00625		KNO	0.00500	1	20171218-P001	12/18/2017 15:50

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

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SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I

010028 Client Sample ID

B3FJY8

Certificate of Analysis

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624988
Result Units: mg/LSDG: 624984
SRR: 60874
Matrix: Water
% Solids: NACase: CHPRC
Project: 20859.01.00X
Receipt Date: 12/12/2017
Collection Date: 12/08/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00886		KNO	0.00500	1	20171218-P001	12/18/2017 17:27
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	12/19/2017 14:39
57-12-5	Total Cyanide	0.00886		KNO	0.00500	1	20171218-P001	12/18/2017 15:50

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I

010029 Client Sample ID

B3FK74

Certificate of Analysis

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624989
Result Units: mg/LSDG: 624984
SRR: 60874
Matrix: Water
% Solids: NACase: CHPRC
Project: 20859.01.00X
Receipt Date: 12/12/2017
Collection Date: 12/08/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.0371		KNO	0.00500	1	20171218-P001	12/18/2017 17:27
57-12-5	Free Cyanide	0.00500	X	KNO	0.00500	1	NA	12/19/2017 14:39
57-12-5	Total Cyanide	0.0472		KNO	0.00500	1	20171218-P001	12/18/2017 15:50

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I

010030 Client Sample ID

B3FK78

Certificate of Analysis

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624990
Result Units: mg/LSDG: 624984
SRR: 60874
Matrix: Water
% Solids: NACase: CHPRC
Project: 20859.01.00X
Receipt Date: 12/12/2017
Collection Date: 12/08/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.0212		KNO	0.00500	1	20171218-P001	12/18/2017 17:27
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	12/19/2017 15:09
57-12-5	Total Cyanide	0.0212		KNO	0.00500	1	20171218-P001	12/18/2017 15:50

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I

010031 Client Sample ID

B3FKJ6

Certificate of Analysis

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624992
Result Units: mg/LSDG: 624984
SRR: 60874
Matrix: Water
% Solids: NACase: CHPRC
Project: 20859.01.00X
Receipt Date: 12/12/2017
Collection Date: 12/08/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 17:27
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	12/19/2017 15:09
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 15:50

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I
Certificate of Analysis

010032 Client Sample ID

B3FKJ7

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624993
Result Units: mg/L

SDG: 624984
SRR: 60874
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X
Receipt Date: 12/12/2017
Collection Date: 12/08/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 17:27
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	12/19/2017 15:09
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 16:19

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I

010033 Client Sample ID

B3FM48

Certificate of Analysis

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624994
Result Units: mg/LSDG: 624984
SRR: 60874
Matrix: Water
% Solids: NACase: CHPRC
Project: 20859.01.00X
Receipt Date: 12/12/2017
Collection Date: 12/08/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 17:27
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	12/19/2017 15:09
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 16:19

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I

010034 Client Sample ID

B3FM49

Certificate of Analysis

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624995
Result Units: mg/LSDG: 624984
SRR: 60874
Matrix: Water
% Solids: NACase: CHPRC
Project: 20859.01.00X
Receipt Date: 12/12/2017
Collection Date: 12/08/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 17:27
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	12/19/2017 15:45
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 16:19

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I

010035 Client Sample ID

B3FM50

Certificate of Analysis

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624996
Result Units: mg/LSDG: 624984
SRR: 60874
Matrix: Water
% Solids: NACase: CHPRC
Project: 20859.01.00X
Receipt Date: 12/12/2017
Collection Date: 12/08/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00542		KNO	0.00500	1	20171218-P001	12/18/2017 17:27
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	12/19/2017 15:09
57-12-5	Total Cyanide	0.00542		KNO	0.00500	1	20171218-P001	12/18/2017 16:19

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I

010036 Client Sample ID

B3FM79

Certificate of Analysis

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624997
Result Units: mg/LSDG: 624984
SRR: 60874
Matrix: Water
% Solids: NACase: CHPRC
Project: 20859.01.00X
Receipt Date: 12/12/2017
Collection Date: 12/08/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 17:27
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	12/19/2017 15:09
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 18:15

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

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REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I
Certificate of Analysis

010037

SwRI ID

PB17M18-C2

Type: Blank

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: PB17M18-C2
Result Units: mg/L

SDG: 624984
SRR: 60874
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X
Receipt Date: NA
Collection Date: NA

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 16:52

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I
Certificate of Analysis

010038

SwRI ID

PB17M18PB2

Type: Blank

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: PB17M18PB2
Result Units: mg/L

SDG: 624984
SRR: 60874
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X
Receipt Date: NA
Collection Date: NA

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 16:19

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I
Certificate of Analysis

010039

SwRI ID

PB17M18PB1

Type: Blank

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: PB17M18PB1
Result Units: mg/L

SDG: 624984
SRR: 60874
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X
Receipt Date: NA
Collection Date: NA

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 15:20

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

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REV.0

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form I

010040

SwRI ID

CN-ICB

Certificate of Analysis

Type: ICB/Blank

Client: CH2M Hill Plateau Remediation Company

SDG: 624984

Case: CHPRC

Task Order: 171212-4

SRR: 60874

Project: 20859.01.00X

Lab ID: CN-ICB

Matrix: Water

Receipt Date: NA

Result Units: mg/L

% Solids: NA

Collection Date: NA

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
57-12-5	Free Cyanide	0.00500	U	KNO	0.00500	1	NA	12/19/2017 14:38

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

SOUTHWEST RESEARCH INSTITUTE **010041**
 WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
 Task Order: 171212-4
 Result Units: mg/L
 Associated Analytical Batches: 20171219-A001

SDG: 624984
 SRR: 60874
 Initial Calibration Source: See Raw Data
 Continuing Calibration Source: See Raw Data

Case: CHPRC
 Project: 20859.01.00X

Analyte	Initial Calibration Verification				Continuing Calibration Verification						
	True	Found	%Rec	Limit	True	Found1	%Rec	Found2	%Rec	Limit	M
Total Cyanide	0.581	0.617	106.2%	90%-110%	0.581	0.614	105.7%	0.611	105.2%	90%-110%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE **010042**
 WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
 Task Order: 171212-4
 Result Units: mg/L
 Associated Analytical Batches: 20171219-A001

SDG: 624984
 SRR: 60874
 Initial Calibration Source: See Raw Data
 Continuing Calibration Source: See Raw Data

Case: CHPRC
 Project: 20859.01.00X

Continuing Calibration Verification											
Analyte	True	Found3	%Rec	Found4	%Rec	Found5	%Rec	Found6	%Rec	Limit	M
Total Cyanide	0.581	0.610	105.0%	0.602	103.6%	0.594	102.2%	0.636	109.5%	90%-110%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE **010043**
WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Result Units: mg/L
Associated Analytical Batches: 20171219-A001

SDG: 624984
SRR: 60874
Initial Calibration Source: See Raw Data
Continuing Calibration Source: See Raw Data

Case: CHPRC
Project: 20859.01.00X

Continuing Calibration Verification					
Analyte	True	Found7	%Rec	Limit	M
Total Cyanide	0.581	0.601	103.4%	90%-110%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE **010044**
 WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
 Task Order: 171212-4
 Result Units: mg/L
 Associated Analytical Batches: 20171219-A003

SDG: 624984
 SRR: 60874
 Initial Calibration Source: See Raw Data
 Continuing Calibration Source: See Raw Data

Case: CHPRC
 Project: 20859.01.00X

Analyte	Initial Calibration Verification				Continuing Calibration Verification						
	True	Found	%Rec	Limit	True	Found1	%Rec	Found2	%Rec	Limit	M
Free Cyanide	0.581	0.604	104.0%	90%-110%	0.581	0.590	101.6%	0.606	104.3%	90%-110%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE **010045**
 WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
 Task Order: 171212-4
 Result Units: mg/L
 Associated Analytical Batches: 20171219-A003

SDG: 624984
 SRR: 60874
 Initial Calibration Source: See Raw Data
 Continuing Calibration Source: See Raw Data

Case: CHPRC
 Project: 20859.01.00X

Continuing Calibration Verification					
Analyte	True	Found3	%Rec	Limit	M
Free Cyanide	0.581	0.637	109.6%	90%-110%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE 010046
WetChem Report - Form IIB
Low Level Check Standard

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Result Units: mg/L
Associated Analytical Batch: 20171219-A001

SDG: 624984
SRR: 60874

Case: CHPRC
Project: 20859.01.00X

LLC Standards					
Analyte	True	Found1	%Rec	Limit	M
Total Cyanide	0.00500	0.00465	93.0%	50%-150%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form IIB-IN

SOUTHWEST RESEARCH INSTITUTE **010047**
WetChem Report - Form IIB
Low Level Check Standard

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Result Units: mg/L
Associated Analytical Batch: 20171219-A003

SDG: 624984
SRR: 60874

Case: CHPRC
Project: 20859.01.00X

LLC Standards					
Analyte	True	Found1	%Rec	Limit	M
Free Cyanide	0.00500	0.00541	108.2%	50%-150%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form IIB-IN

SOUTHWEST RESEARCH INSTITUTE **010048**
WetChem Report - Form III

Blanks

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Preparation Blank Result Units: mg/L
Initial/Continuing Blank Result Units: mg/L

SDG: 624984
SRR: 60874
Preparation Blank Matrix: Water
Associated Prep Batches: 20171218-P001

Case: CHPRC
Project: 20859.01.00X
Associated Analytical Batches: 20171219-A001

Analyte	Preparation Blank		Initial Calibration Blank		Continuing Calibration Blank										M
	Result	Qual	Found	Qual	Found1	Qual	Found2	Qual	Found3	Qual	Found4	Qual	Found5	Qual	
Total Cyanide	0.00500	U	0.00500	U	0.00500	U	0.00500	U	0.00500	U	0.00500	U	0.00500	U	KNO

Data Reporting Qualifiers (Qual)	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	KNO - Konelab/Cyanide 9012 KNO - Konelab/Amenable Cyanide KNO - Konelab/Cyanide 9014 NA - Not Applicable

SOUTHWEST RESEARCH INSTITUTE **010049**
WetChem Report - Form III

Blanks

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Preparation Blank Result Units: mg/L
Initial/Continuing Blank Result Units: mg/L

SDG: 624984
SRR: 60874
Preparation Blank Matrix: Water
Associated Prep Batches: 20171218-P001

Case: CHPRC
Project: 20859.01.00X
Associated Analytical Batches: 20171219-A001

Continuing Calibration Blank					
Analyte	Found6	Qual	Found7	Qual	M
Total Cyanide	0.00500	U	0.00500	U	KNO

Data Reporting Qualifiers (Qual)	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	KNO - Konelab/Cyanide 9012 KNO - Konelab/Amenable Cyanide KNO - Konelab/Cyanide 9014 NA - Not Applicable

SOUTHWEST RESEARCH INSTITUTE **010050**
WetChem Report - Form III

Blanks

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Preparation Blank Result Units: mg/L
Initial/Continuing Blank Result Units: mg/L

SDG: 624984
SRR: 60874
Preparation Blank Matrix: Water
Associated Prep Batches: 20171218-P001

Case: CHPRC
Project: 20859.01.00X
Associated Analytical Batches: 20171219-A002

Analyte	Preparation Blank		Initial Calibration Blank		Continuing Calibration Blank		M
	Result	Qual	Found	Qual	Found1	Qual	
Amenable Cyanide	0.00500 0.00500	U U	-	-	-	-	KNO

Data Reporting Qualifiers (Qual)	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	KNO - Konelab/Cyanide 9012 KNO - Konelab/Amenable Cyanide KNO - Konelab/Cyanide 9014 NA - Not Applicable

SOUTHWEST RESEARCH INSTITUTE **010051**
WetChem Report - Form III

Blanks

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Preparation Blank Result Units: mg/L
Initial/Continuing Blank Result Units: mg/L

SDG: 624984
SRR: 60874
Preparation Blank Matrix: Water
Associated Prep Batches: 20171215-P001

Case: CHPRC
Project: 20859.01.00X
Associated Analytical Batches: 20171219-A003

Analyte	Preparation Blank		Initial Calibration Blank		Continuing Calibration Blank						M
	Result	Qual	Found	Qual	Found1	Qual	Found2	Qual	Found3	Qual	
Free Cyanide	0.00500	U	0.00500	U	0.00500	U	0.00500	U	0.00500	U	KNO

Data Reporting Qualifiers (Qual)	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	KNO - Konelab/Cyanide 9012 KNO - Konelab/Amenable Cyanide KNO - Konelab/Cyanide 9014 NA - Not Applicable

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form VA

010052 Client Sample ID
B3FJX6MS/MSD

Matrix Spike/Matrix Spike Duplicate Sample Recovery

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624985S
Result Units: mg/L

SDG: 624984
SRR: 60874
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X

Analyte	Parent Sample Result	Qual	MS Result	MS Spike Added	MS %Rec	MSD Result	MSD Spike Added	MSD %Rec	%RPD	Control Limit %Rec	Control Limit %RPD	M	Note
Total Cyanide	0.00500	U	0.0497	0.0500	99.4%	-	-	-	-	75%-125%	-	KNO	

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	M - Instrument	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	MS - Matrix Spike	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	MSD - Matrix Spike Duplicate	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences	Q - Qualifier	NA - Not Applicable
D - Result is reported from a dilution	RPD - Relative Percent Difference	
* - Duplicate criteria was not met		

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form VA

010053 Client Sample ID
B3FM79MS/MSD

Matrix Spike/Matrix Spike Duplicate Sample Recovery

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624997S
Result Units: mg/L

SDG: 624984
SRR: 60874
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X

Analyte	Parent Sample Result	Qual	MS Result	MS Spike Added	MS %Rec	MSD Result	MSD Spike Added	MSD %Rec	%RPD	Control Limit %Rec	Control Limit %RPD	M	Note
Total Cyanide	0.00500	U	0.0605	0.0500	121.0%	-	-	-	-	75%-125%	-	KNO	

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	M - Instrument	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	MS - Matrix Spike	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	MSD - Matrix Spike Duplicate	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences	Q - Qualifier	NA - Not Applicable
D - Result is reported from a dilution	RPD - Relative Percent Difference	
* - Duplicate criteria was not met		

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form VB

010054 Client Sample ID

B3FM79AS

Post-Digestion Spike Sample Recovery

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624997AS-F
Result Units: mg/L

SDG: 624984
SRR: 60874
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.006

Analyte	Parent Sample Result	Qual	Spiked Sample Result	Qual	Spike Added	%Rec.	Control Limit	M	Q	DF	Prep Batch	Analysis Date/Time	Note
Amenable Cyanide	-		-		-	-	-	NA		-		-	
Free Cyanide	0.00500	UX	0.0281	X	0.250	11.2%	80%-120%	KNO	X	1	NA	12/19/2017 15:45	
Total Cyanide	-		-		-	-	-	NA		-		-	

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	M - Instrument	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	MS - Matrix Spike	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	MSD - Matrix Spike Duplicate	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences	Q - Qualifier	NA - Not Applicable
D - Result is reported from a dilution	RPD - Relative Percent Difference	
* - Duplicate criteria was not met		

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form VB

010055 Client Sample ID

B3FJX6AS

Post-Digestion Spike Sample Recovery

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624985AS-F
Result Units: mg/LSDG: 624984
SRR: 60874
Matrix: Water
% Solids: NACase: CHPRC
Project: 20859.01.006

Analyte	Parent Sample Result	Qual	Spiked Sample Result	Qual	Spike Added	%Rec.	Control Limit	M	Q	DF	Prep Batch	Analysis Date/Time	Note
Amenable Cyanide	-		-		-	-	-	NA		-		-	
Free Cyanide	0.00500	UX	0.166	X	0.250	66.4%	80%-120%	KNO	X	1	NA	12/19/2017 16:17	
Total Cyanide	-		-		-	-	-	NA		-		-	

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	M - Instrument	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	MS - Matrix Spike	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	MSD - Matrix Spike Duplicate	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences	Q - Qualifier	NA - Not Applicable
D - Result is reported from a dilution	RPD - Relative Percent Difference	
* - Duplicate criteria was not met		

Form VB-IN

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form VI

010056 Client Sample ID

B3FJX6D

Duplicates

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624985D-F
Result Units:SDG: 624984
SRR: 60874
Matrix: Water
% Solids: NACase: CHPRC
Project: 20859.01.00X

Analyte	Parent Sample Result	Qual	Duplicate Result	Qual	RPD	RPD Limit	Control Limit	M	Note
Amenable Cyanide	0.00500	U	0.00500	U	0.00%	-	-	KNO	
Free Cyanide	0.00500	UX	0.00500	UX	0.00%	20%	-	KNO	#
Total Cyanide	0.00500	U	0.00500	U	0.00%	20%	-	KNO	#

indicates that both the parent and duplicate sample results are below the RL, therefore no RPD limit or control limit is applicable.

Data Reporting Qualifiers (Qual)	Columns	Instruments/Method (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	M - Instrument RPD - Relative Percent Difference	KNO - Konelab/Cyanide 9012 KNO - Konelab/Amenable Cyanide KNO - Konelab/Cyanide 9014 NA - Not Applicable

Form VI-IN

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form VI

010057 Client Sample ID

B3FM79D

Duplicates

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: 624997D-F
Result Units:SDG: 624984
SRR: 60874
Matrix: Water
% Solids: NACase: CHPRC
Project: 20859.01.00X

Analyte	Parent Sample Result	Qual	Duplicate Result	Qual	RPD	RPD Limit	Control Limit	M	Note
Amenable Cyanide	0.00500	U	0.00500	U	0.00%	-	-	KNO	
Free Cyanide	0.00500	UX	0.00500	UX	0.00%	20%	-	KNO	#
Total Cyanide	0.00500	U	0.00500	U	0.00%	20%	-	KNO	#

indicates that both the parent and duplicate sample results are below the RL, therefore no RPD limit or control limit is applicable.

Data Reporting Qualifiers (Qual)	Columns	Instruments/Method (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	M - Instrument RPD - Relative Percent Difference	KNO - Konelab/Cyanide 9012 KNO - Konelab/Amenable Cyanide KNO - Konelab/Cyanide 9014 NA - Not Applicable

Form VI-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE

010058

SwRI ID

WetChem Report - Form VII

LCS17M18CS1

Laboratory Control Sample

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: LCS17M18CS1
Result Units: mg/L

SDG: 624984
SRR: 60874
Matrix: Water
Associated Prep Batches: 20171218-P001

Case: CHPRC
Project: 20859.01.00X
LCS Source: ERA

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.581	0.601	D	103.4%	85%-115%	KNO	12/18/2017 15:20

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form VII-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VII

010059

SwRI ID

LCS17M18CS2

Laboratory Control Sample

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: LCS17M18CS2
Result Units: mg/L

SDG: 624984
SRR: 60874
Matrix: Water
Associated Prep Batches: 20171218-P001

Case: CHPRC
Project: 20859.01.00X
LCS Source:

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.500	0.479		95.8%	90%-110%	KNO	12/18/2017 15:20

Instruments/Methods (M)

KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form VII-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VII

Laboratory Control Sample

010060

SwRI ID

LCS17M18CS3

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Lab ID: LCS17M18CS3
Result Units: mg/L

SDG: 624984
SRR: 60874
Matrix: Water
Associated Prep Batches: 20171218-P001

Case: CHPRC
Project: 20859.01.00X
LCS Source:

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.0500	0.0514		102.8%	90%-110%	KNO	12/18/2017 15:20

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form VII-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VII

Laboratory Control Sample

010061

SwRI ID

CN-ICV

Client: CH2M Hill Plateau Remediation Company

Task Order: 171212-4

Lab ID: CN-ICV

Result Units: mg/L

SDG: 624984

SRR: 60874

Matrix: Water

Associated Prep Batches: 20171215-P001

Case: CHPRC

Project: 20859.01.00X

LCS Source: ERA

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Free Cyanide	0.581	0.604	D	104.0%	85%-115%	KNO	12/19/2017 14:38

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form VII-IN

SOUTHWEST RESEARCH INSTITUTE 010062
WetChem Report - Form IX

Detection Limits

Client: CH2M Hill Plateau Remediation Company
Task Order: 171212-4
Result Units: mg/L

SDG: 624984
SRR: 60874
Instrument: Konelab

Case: CHPRC
Project: 20859.01.00X
Date: 01/09/2014

Analyte	Wavelength	RL
Amenable Cyanide	575 nm	0.00500
Free Cyanide	575 nm	0.00500
Total Cyanide	575 nm	0.00500

Columns
RL - SwRI Reporting Limit