FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Martina Litasi

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter 100', Geotech Geosub SS Pump # 2697, Geotech Buckbooster controller # 2517

GENERAL					
WELL/LOCATION	CG-4A				
WATER SOURCE	Groundwater				
DATE	10/9/09 →				
TIME	0853	0916	0919	0922	0925
SAMPLING CONDITIONS	pump Malfunction				
SAMPLING METHOD	Low Flow Purge with 1.5"x12"submersible bladder pump				
DEPTH OF SAMPLE (BGS / TOC)	~24'				
WELL DEPTH (BGS / TOC)	29.11'				
WATER LEVEL (BGS / TOC)	9.43'				
ONE WET CASING VOLUME	LF		For 1 inch wells: (TD-WL)x0.04= N/A gallons		
For 2 inch wells: (TD-WL)x0.16= gallons	1.4l		For 4 inch wells: (TD-WL)x0.65= N/A gallons		
APPEARANCE	sl turbid brown	mod turbid brown →			sl. turbid brown
FIELD MEASUREMENTS					
VOLUME REMOVED (GAL)	~2l	1.5l	1.5l	1.5l	1l
TOTAL VOLUME REMOVED (GAL)	~2l	3.5l	5l	6.5l	7.5l
TEMPERATURE (°C or °F)	13.25°C	13.91°C	13.80°C	13.82°C	13.84°C
CONDUCTIVITY (ATC, 25°C) mS/cm	0.974	0.966	0.963	0.961	0.964
pH	7.35	7.36	7.37	7.37	7.37
REDOX (mV)	16.2	47.9	46.9	44.6	44.4
OTHER D.O. % / mg/L	10.1/1.05	10.5/1.18	10.7/1.19	10.5/1.18	10.6/1.09
PURGE OR SAMPLE	P	P	P	P	S
SAMPLES COLLECTED AND SAMPLE ANALYSIS					
GROSS UF/UP					
DISSOLVED METALS F/HNO_3					
TOTAL METALS UF/HNO_3					
PETROLEUM HCs UF/HCl					
VOLATILE ORGANICS UF/UP / UF/HCl					3 -40mL VOAs on ice @ 4°C
SEMIVOLATILE ORGANICS UF/UP					
LAB/DATE SUBMITTED					TA 10/12/09

EnviroGroup Limited

SAMPLER'S INITIALS MKL DATE 10/9/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Martina Litasi

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter 100', Geotech Geosub SS Pump #2697, Geotech Buckbooster controller #2517

GENERAL					
WELL/LOCATION	HC-11				
WATER SOURCE	Groundwater				
DATE	10/9/09	→			
TIME	1007	1008	1009	1010	1011

SAMPLING CONDITIONS	
SAMPLING METHOD	Low Flow Purge with 1.5"x12"submersible bladder pump
DEPTH OF SAMPLE (BGS / TOC)	~~~15.0'~~ 14.0'
WELL DEPTH (BGS / TOC)	17.77'
WATER LEVEL (BGS / TOC)	7.83'
ONE WET CASING VOLUME	LF
For 2 inch wells: (TD-WL)x0.16= _____ gallons	1.11 l
For 1 inch wells: (TD-WL)x0.04= N/A gallons	
For 4 inch wells: (TD-WL)x0.65= N/A gallons	

FIELD MEASUREMENTS					
APPEARANCE	clear →				
VOLUME REMOVED (GAL)	2 l	2 l	2 l	2 l	2 l
TOTAL VOLUME REMOVED (GAL)	2 l	4 l	6 l	8 l	10 l
TEMPERATURE (°C or °F)	15.76	15.82	15.82	15.83	15.85
CONDUCTIVITY (ATC, 25°C) mS/cm	3.158	3.164	3.165	3.166	3.166
pH	7.24	7.24	7.23	7.23	7.24
REDOX (mV)	71.2	69.3	63.3	66.3	65.6
OTHER D.O. %/mg/L	10.3/1.00	9.2/0.90	8.5/0.83	8.0/0.78	7.9/0.71
PURGE OR SAMPLE	P	P	P	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
GROSS UF/UP					
DISSOLVED METALS F/HNO_3					
TOTAL METALS UF/HNO_3					
PETROLEUM HCs UF/HCl					
VOLATILE ORGANICS UF/UP / UF/HCl					3 - 40 mL VOAs on ice @ 4°C
SEMIVOLATILE ORGANICS UF/UP					
LAB/DATE SUBMITTED					TA 10/12/09

EnviroGroup Limited

SAMPLER'S INITIALS MKL DATE 10/9/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Martina Litasi

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter 100', Geotech Geosub SS Pump #2697, Geotech Buckbooster controller # 2517

GENERAL					
WELL/LOCATION	HC-12				
WATER SOURCE	Groundwater				
DATE	10/9/09	→			→
TIME	1113	1116	1118	1120	1123
SAMPLING CONDITIONS					
SAMPLING METHOD	Low Flow Purge with 1.5"x12"submersible bladder pump				
DEPTH OF SAMPLE (BGS / TOC)	~ 22'				
WELL DEPTH (BGS / TOC)	27.09'				
WATER LEVEL (BGS / TOC)	16.2'				
ONE WET CASING VOLUME	LF 1.36 l		For 1 inch wells: (TD-WL)x0.04= N/A gallons		
For 2 inch wells: (TD-WL)x0.16= gallons			For 4 inch wells: (TD-WL)x0.65= N/A gallons		
APPEARANCE	Clear	→			→
FIELD MEASUREMENTS					
VOLUME REMOVED (GAL)	2 l	2 l	2 l	2 l	2 l
TOTAL VOLUME REMOVED (GAL)	2 l	4 l	6 l	8 l	10 l
TEMPERATURE (°C or °F)	12.42	12.58	12.55	12.56	12.57
CONDUCTIVITY (ATC, 25°C) mS/cm	4.287	4.424	4.566	4.563	4.562
pH	7.15	7.12	7.09	7.08	7.08
REDOX (mV)	~~147~~ 82.1	80.4	78.0	76.1	76.1
OTHER D.O. %/mg/L	12.9 / 1.36	11.3 / 1.19	10.3 / 1.07	10.1 / 1.05	10.0 / 1.04
PURGE OR SAMPLE	P	P	P	P	S
SAMPLES COLLECTED AND SAMPLE ANALYSIS					
GROSS UF/UP					
DISSOLVED METALS F/HNO_3					
TOTAL METALS UF/HNO_3					
PETROLEUM HCs UF/HCl					
VOLATILE ORGANICS UF/UP / UF/HCl					3 -40 mL VOAS on ice @ 4°C
SEMIVOLATILE ORGANICS UF/UP					
LAB/DATE SUBMITTED					TA 10/12/09

EnviroGroup Limited

SAMPLER'S INITIALS MKL DATE 10/9/09

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FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Martina Litasi

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter 100', Geotech Geosub SS Pump #2697, Geotech Buckbooster controller #2517

GENERAL					
WELL/LOCATION	HC-3				
WATER SOURCE	Groundwater				
DATE	10/9/09	→			
TIME	1201	1203	1204	1206	1207

SAMPLING CONDITIONS	
SAMPLING METHOD	Low Flow Purge with 1.5"x12"submersible bladder pump
DEPTH OF SAMPLE (BGS / TOC)	23'
WELL DEPTH (BGS / TOC)	27.62
WATER LEVEL (BGS / TOC)	18.34
ONE WET CASING VOLUME	LF 1.38l
For 1 inch wells: (TD-WL)x0.04= NA gallons	
For 2 inch wells: (TD-WL)x0.16= _____ gallons	
For 4 inch wells: (TD-WL)x0.65= NA gallons	

FIELD MEASUREMENTS					
APPEARANCE	Clear	→			
VOLUME REMOVED (GAL)	2l	2l	2l	2l	2l
TOTAL VOLUME REMOVED (GAL)	2l	4l	6l	8l	10l
TEMPERATURE (°C or °F)	13.70	14.09	14.19	14.18	14.19
CONDUCTIVITY (ATC, 25°C) mS/cm	3.502	3.504	3.516	3.510	3.504
pH	~~7.15~~ 7.23	7.20	7.18	7.16	7.15
REDOX (mV)	74.1	71.6	71.7	70.4	70.4
OTHER D.O % / mg/L	14.0 / 1.44	12.1 / 1.32	12.7 / 1.29	12.0 / 1.21	11.8 / 1.20
PURGE OR SAMPLE	P	P	P	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS	UF/UP					
	UF/HCl					3 -40 mL VOAS on ice @ 4°C
SEMIVOLATILE ORGANICS	UF/UP					
LAB/DATE SUBMITTED						TA 10/12/09

EnviroGroup Limited

SAMPLER'S INITIALS MKL DATE 10/9/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Martina Litasi

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter 100', Geotech Geosub SS Pump # 2697, Geotech Buckbooster controller # 2517

GENERAL					
WELL/LOCATION	CG-1				
WATER SOURCE	Groundwater				
DATE	10/9/09	→			
TIME	1253	1254	1256	1258	1300

SAMPLING CONDITIONS					
SAMPLING METHOD	Low Flow Purge with 1.5"x12"submersible bladder pump				
DEPTH OF SAMPLE (BGS / TOC)	~ 14.0'				
WELL DEPTH (BGS / TOC)	14.52'				
WATER LEVEL (BGS / TOC)	10.09'				
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= ____ gallons	CP 1.17 l		For 1 inch wells: (TD-WL)x0.04= N/A gallons For 4 inch wells: (TD-WL)x0.65= N/A gallons		
APPEARANCE	Clear				

FIELD MEASUREMENTS					
VOLUME REMOVED (GAL)	3 l	2 l	2 l	2 l	3 l
TOTAL VOLUME REMOVED (GAL)	3 l	5 l	7 l	9 l	12 l
TEMPERATURE (°C or °F)	16.89	17.27	17.36	17.32	17.35
CONDUCTIVITY (ATC, 25°C) mS/cm	1.045	1.043	1.039	1.046	1.039
pH	7.46	7.41	7.38	7.38	7.37
REDOX (mV)	59.8	66.8	63.0	63.4	63.4
OTHER DO % / mg/L	20.3 / 2.90	29.5 / 2.83	29.5 / 2.82	29.5 / 2.82	27.8 / 2.75
PURGE OR SAMPLE	P	P	P	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS	UF/UP UF/HCl					3 - 40 mL VOAs on ice @ 4°C
SEMIVOLATILE ORGANICS	UF/UP					
LAB/DATE SUBMITTED						TA 10/12/09

EnviroGroup Limited

SAMPLER'S INITIALS MKL DATE 10/9/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Coleman Hoyt, Mike Jahn

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter - 100ft

GeoTech Geosub SS Pump # 2528, GeoTech Buckbooster controller # 2570

GENERAL					
WELL/LOCATION	EMW-04S				
WATER SOURCE	Groundwater				
DATE	12/1/09	→	→	→	
TIME	0811	0812	0814	0817	
SAMPLING CONDITIONS					
SAMPLING METHOD	Low Flow Purge with 1.5" X 12" submersible bladder pump				
DEPTH OF SAMPLE (BGS / TOC)	~~14.74'~~ 15.55'				
WELL DEPTH (BGS / TOC)	17.21'				
WATER LEVEL (BGS / TOC)	13.89'				
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=_____ gallons				
	For 2 inch wells: (TD-WL)x0.16=_____ gallons		For 4 inch wells: (TD-WL)x0.65=_____ gallons		
APPEARANCE	sl. turb brown	→	cloudy - clearing	→	
FIELD MEASUREMENTS		1.21 l			
VOLUME REMOVED ~~(GAL)~~ l	1.21 l	~~2.42 l~~ 1.21 l	1.21 l	1.21 l	
TOTAL VOLUME REMOVED ~~(GAL)~~ l	1.21 l	2.42 l	3.63 l	4.84	
TEMPERATURE (°C or °F)	13.92	15.23	15.32	15.36	
CONDUCTIVITY (ATC, 25°C)	2.554	2.620	2.619	2.617	
pH	7.27	7.10	7.06	7.09	
REDOX (mV)	194.9	193.0	191.2	185.4	
DO (% / mg/L)	51.2 /	47.8 /	47.6 /	44.1 /	
PURGE OR SAMPLE mg/L	P 5.19	P 4.69	P 4.69	S 4.37	
SAMPLES COLLECTED AND SAMPLE ANALYSIS					
GROSS UF/UP					
DISSOLVED METALS F/HNO_3					
TOTAL METALS UF/HNO_3					
PETROLEUM HCs UF/HCl					
VOLATILE ORGANICS UF/UP					3 - 40 mL VOAs
SEMIVOLATILE ORGANICS UF/UP					
LAB/DATE SUBMITTED					TA 12/2/09

EnviroGroup Limited

SAMPLER'S INITIALS MJ/CH DATE 12/1/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Coleman Hoyt, Mike Jahn

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter - 100ft

GeoTech Geosub SS Pump # 2526 , GeoTech Buckbooster controller # 2570

GENERAL					
WELL/LOCATION	EMW-04D				
WATER SOURCE	Groundwater				
DATE	12/1/09	→	→	→	
TIME	0847	0849	0850	0852	

SAMPLING CONDITIONS					
SAMPLING METHOD	Low Flow Purge with 1.5" X 12" submersible bladder pump				
DEPTH OF SAMPLE (BGS / TOC)	23.78'				
WELL DEPTH (BGS / TOC)	28.78'				
WATER LEVEL (BGS / TOC)	14.05				
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=_____ gallons				
	For 2 inch wells: (TD-WL)x0.16=_____ gallons		For 4 inch wells: (TD-WL)x0.65=_____ gallons		
APPEARANCE	mod turb brn	→	→	→	

FIELD MEASUREMENTS					
VOLUME REMOVED ~~(GAL)~~ l	1.4	1.4	1.4	1.4	
TOTAL VOLUME REMOVED ~~(GAL)~~ l	1.4	2.8	4.2	5.6	
TEMPERATURE (°C or °F)	14.67	15.20	15.38	15.46	
CONDUCTIVITY (ATC, 25°C)	5.704	5.792	5.822	5.860	
pH	7.01	6.96	6.96	6.96	
REDOX (mV)	218.6	206.9	198.1	191.3	
DO (% / mg/L)	24.5 / 2.10	10.7 / 1.04	9.2 / 0.90	9.2 / 0.90	
PURGE OR SAMPLE	~~P~~ P	P	P	S	

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS	UF/UP					3 - 40 mL VOAs
SEMIVOLATILE ORGANICS	UF/UP					
LAB/DATE SUBMITTED						TA 12/2/09

EnviroGroup Limited

SAMPLER'S INITIALS MK/CH DATE 12/1/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Coleman Hoyt, Mike Jahn

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter - 100ft

GeoTech Geosub SS Pump # 2526 , GeoTech Buckbooster controller # 2570

GENERAL						
WELL/LOCATION	EMW-05 + EMW-05 DUP					
WATER SOURCE	Groundwater					
DATE	12/1/09	→				
TIME	0925	0927	0929	0931	0933	0934

SAMPLING CONDITIONS					
SAMPLING METHOD	Low Flow Purge with 1.5" X 12" submersible bladder pump				
DEPTH OF SAMPLE (BGS / TOC)	19.75'				
WELL DEPTH (BGS / TOC)	22.25				
WATER LEVEL (BGS / TOC)	16.78				
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=_____ gallons				
For 2 inch wells: (TD-WL)x0.16=_____ gallons	For 4 inch wells: (TD-WL)x0.65=_____ gallons				
APPEARANCE	sl. turb brn	→	Cloudy Clear - Brown	→	

FIELD MEASUREMENTS						
VOLUME REMOVED (~~GAL~~) l	1.3	1.3	1.3	1.3	1.3	
TOTAL VOLUME REMOVED (~~GAL~~) l	1.3	2.6	3.9	5.2	6.5	
TEMPERATURE (°C or °F)	14.96	15.24	15.87	16.23	16.53	16.60
CONDUCTIVITY (ATC, 25°C)	3.019	3.013	2.985	2.972	2.960	2.958
pH	7.49	7.30	7.24	7.20	7.17	7.17
REDOX (mV)	187.0	181.3	176.4	171.7	167.1	165.9
DO (% / mg/L)	20.3 / 1.97	14.7 / 1.45	13.7 / 1.33	12.7 / 1.23	12.4 / 1.20	12.1/1.1
PURGE OR SAMPLE	P	P	P	P	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS UF/UP						
DISSOLVED METALS F/HNO_3						
TOTAL METALS UF/HNO_3						
PETROLEUM HCs UF/HCl						
VOLATILE ORGANICS UF/UP						6 - 40 mL VOAs
SEMIVOLATILE ORGANICS UF/UP						
LAB/DATE SUBMITTED						TA 12/2/09

EnviroGroup Limited

SAMPLER'S INITIALS MJ/CH DATE 12/1/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Coleman Hoyt, Mike Jahn

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter - 100ft

GeoTech Geosub SS Pump # 2526 , GeoTech Buckbooster controller # 2570

GENERAL					
WELL/LOCATION	EMW-01				
WATER SOURCE	Groundwater				
DATE	12/1/09	→	→	→	→
TIME	1012	1015	1017	1019	1020
SAMPLING CONDITIONS					
SAMPLING METHOD	Low Flow Purge with 1.5" X 12" submersible bladder pump				
DEPTH OF SAMPLE (BGS / TOC)	13.48'				
WELL DEPTH (BGS / TOC)	15.98'				
WATER LEVEL (BGS / TOC)	10.78'				
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=_____ gallons				
	For 2 inch wells: (TD-WL)x0.16=_____ gallons		For 4 inch wells: (TD-WL)x0.65=_____ gallons		
APPEARANCE	sl turb drk brn	→	cloudy - clear	→	→
FIELD MEASUREMENTS					
VOLUME REMOVED ~~(GAL)~~ l	1.16	1.16	1.16	1.16	1.16
TOTAL VOLUME REMOVED ~~(GAL)~~ l	1.16	2.32	3.48	4.64	5.8
TEMPERATURE (°C or °F)	13.38	14.23	14.38	14.40	14.40
CONDUCTIVITY (ATC, 25°C)	1.369	1.362	1.364	1.366	1.366
pH	7.58	7.25	7.17	7.13	7.11
REDOX (mV)	173.9	172.7	168.6	164.9	163.0
DO (% / mg/L)	32.4 / 3.19	20.8 / 2.12	18.8 / 1.91	17.7 / 1.79	17.1 / 1.73
PURGE OR SAMPLE	P	P	P	P	S
SAMPLES COLLECTED AND SAMPLE ANALYSIS					
GROSS UF/UP					
DISSOLVED METALS F/HNO_3					
TOTAL METALS UF/HNO_3					
PETROLEUM HCs UF/HCl					
VOLATILE ORGANICS UF/UP					3 - 40 mL VOAs
SEMIVOLATILE ORGANICS UF/UP					
LAB/DATE SUBMITTED					TA - 12/2/09

EnviroGroup Limited

SAMPLER'S INITIALS MJ/CH DATE 12/1/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Coleman Hoyt, Mike Jahn

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter - 100ft

GeoTech Geosub SS Pump # 2526 , GeoTech Buckbooster controller # 2570

GENERAL					
WELL/LOCATION	EMW-02				
WATER SOURCE	Groundwater				
DATE	12/1/09	→	→	→	→
TIME	1047	1048	1050	1052	1054

SAMPLING CONDITIONS	
SAMPLING METHOD	Low Flow Purge with 1.5" X 12" submersible bladder pump
DEPTH OF SAMPLE (BGS / TOC)	17.0
WELL DEPTH (BGS / TOC)	19.50' - Soft Bottom
WATER LEVEL (BGS / TOC)	13.76'
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=_____ gallons
For 2 inch wells: (TD-WL)x0.16=_____ gallons	For 4 inch wells: (TD-WL)x0.65=_____ gallons

FIELD MEASUREMENTS					
APPEARANCE	Grayish Brn. V.L. turb	→	→	→	→
		Petroleum odor	→	→	→
VOLUME REMOVED ~~(GAL)~~ l	2.0 l	2.0 l	4.0 l	4.0 l	4.0 l
TOTAL VOLUME REMOVED ~~(GAL)~~ l	2.0 l	4.0 l	8.0 l	12.0 l	16.0 l
TEMPERATURE (°C or °F)	13.73	14.34	14.77	14.85	14.82
CONDUCTIVITY (ATC, 25°C)	2.926	2.928	2.909	2.897	2.893
pH	6.86	6.88	6.90	6.91	6.92
REDOX (mV)	5.9	-15.5	-33.8	-47.3	-57.8
DO (% / mg/L)	24.8 / 2.52	20.0 / 2.02	13.7 / 1.38	10.5 / 1.06	9.2 / 0.92
PURGE OR SAMPLE	P	P	P	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS	UF/UP					3 - 40 mL VOAs
SEMIVOLATILE ORGANICS	UF/UP					
LAB/DATE SUBMITTED						TA 12/2/09

EnviroGroup Limited

SAMPLER'S INITIALS MJ/CH DATE 12/1/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Coleman Hoyt, Mike Jahn

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter - 100ft

GeoTech Geosub SS Pump # 2526 , GeoTech Buckbooster controller # 2570

GENERAL					
WELL/LOCATION	EMW-03S				
WATER SOURCE	Groundwater				
DATE	12/1/09	→	→	→	
TIME	1127	1129	1131	1133	

SAMPLING CONDITIONS					
SAMPLING METHOD	Low Flow Purge with 1.5" X 12" submersible bladder pump				
DEPTH OF SAMPLE (BGS / TOC)	22.80'				
WELL DEPTH (BGS / TOC)	25.30 s6				
WATER LEVEL (BGS / TOC)	20.15				
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=_____ gallons				
	For 2 inch wells: (TD-WL)x0.16=_____ gallons		For 4 inch wells: (TD-WL)x0.65=_____ gallons		
APPEARANCE	if mod turb brn	→	→	→	

FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~) l	1.4	1.4	1.4	1.4	
TOTAL VOLUME REMOVED (~~GAL~~) l	1.4	2.8	4.2	5.6	
TEMPERATURE (°C or °F)	17.30	17.75	17.54	17.90	
CONDUCTIVITY (ATC, 25°C)	3,420	3.421	3.415	3.414	
pH	7.20	7.14	7.14	7.14	
REDOX (mV)	49.5	44.5	42.1	41.9	
DO (% / mg/L)	16.7/1.57	14.1/1.32	12.8/1.20	12.4/1.17	
PURGE OR SAMPLE	P	P	P	S	

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS	UF/UP					3 - 40 mL VOAs
SEMIVOLATILE ORGANICS	UF/UP					
LAB/DATE SUBMITTED						TA 12/2/09

EnviroGroup Limited

SAMPLER'S INITIALS MJ / CH DATE 12/1/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Coleman Hoyt, Mike Jahn

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter - 100ft

GeoTech Geosub SS Pump # 2526 , GeoTech Buckbooster controller # 2570

GENERAL					
WELL/LOCATION	EMW-03D				
WATER SOURCE	Groundwater				
DATE	12/1/09	→	→	→	
TIME	1154	1156	1158	1200	

SAMPLING CONDITIONS					
SAMPLING METHOD	Low Flow Purge with 1.5" X 12" submersible bladder pump				
DEPTH OF SAMPLE (BGS / TOC)	35.25'				
WELL DEPTH (BGS / TOC)	40.25' sb				
WATER LEVEL (BGS / TOC)	20.31'				
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16=_____ gallons			For 1 inch wells: (TD-WL)x0.04=_____ gallons For 4 inch wells: (TD-WL)x0.65=_____ gallons		
APPEARANCE	mod turb brn	→	→	→	

FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~) l	1.66	1.66	1.66	1.66	
TOTAL VOLUME REMOVED (~~GAL~~) l	1.66	3.32	4.98	6.64	
TEMPERATURE (°C or °F)	16.13	16.68	16.85	16.82	
CONDUCTIVITY (ATC, 25°C)	5.681	5.752	5.767	5.775	
pH	7.00	7.00	7.01	7.00	
REDOX (mV)	117.3	105.0	96.4	90.8	
DO (% / mg/L)	15.5/1.45	9.2/0.87	6.9/0.65	6.1/0.58	
PURGE OR SAMPLE	P	P	P	S	

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS	UF/UP					3 - 40 mL VOAs
SEMIVOLATILE ORGANICS	UF/UP					
LAB/DATE SUBMITTED						TA 12/2/09

EnviroGroup Limited

SAMPLER'S INITIALS MA/CH DATE 12/1/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Coleman Hoyt, Mike Jahn

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter - 100ft

GeoTech Geosub SS Pump # 2526 , GeoTech Buckbooster controller # 2570

GENERAL					
WELL/LOCATION	MW-1054-2				
WATER SOURCE	Groundwater				
DATE	12/1/09	→	→		
TIME	1248	1251	1253		

SAMPLING CONDITIONS					
SAMPLING METHOD	Low Flow Purge with 1.5" X 12" submersible bladder pump				
DEPTH OF SAMPLE (BGS / TOC)	16.39				
WELL DEPTH (BGS / TOC)	19.42' - Hard Bottom				
WATER LEVEL (BGS / TOC)	13.35'				
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=_____ gallons				
For 2 inch wells: (TD-WL)x0.16=_____ gallons	For 4 inch wells: (TD-WL)x0.65=_____ gallons				
APPEARANCE	mod turb gray-brn	→	sl. turb gray brn		

FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~) l	1.23	1.23	1.23		
TOTAL VOLUME REMOVED (~~GAL~~) l	1.23	2.46	3.69		
TEMPERATURE (°C or °F)	13.55	14.35	14.54		
CONDUCTIVITY (ATC, 25°C)	3.308	3.323	3.330		
pH	6.97	6.89	6.88		
REDOX (mV)	115.5	111.3	108.2		
DO (% / mg/L)	22.8/2.29	18.7/1.88	17.0/1.72		
PURGE OR SAMPLE	P	P	S		

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
GROSS UF/UP					
DISSOLVED METALS F/HNO_3					
TOTAL METALS UF/HNO_3					
PETROLEUM HCs UF/HCl					
VOLATILE ORGANICS UF/UP					3 - 40 mL VOAs
SEMIVOLATILE ORGANICS UF/UP					
LAB/DATE SUBMITTED					TA 12/2/09

EnviroGroup Limited

SAMPLER'S INITIALS MJ/CH DATE 12/1/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Coleman Hoyt, Mike Jahn

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter - 100ft

GeoTech Geosub SS Pump # 2526 , GeoTech Buckbooster controller # 2570

GENERAL					
WELL/LOCATION	MW-2 + MW-2 REP				
WATER SOURCE	Groundwater				
DATE	12/1/09	→			
TIME	1322	1324	1326	1328	

SAMPLING CONDITIONS	
SAMPLING METHOD	Low Flow Purge with 1.5" X 12" submersible bladder pump
DEPTH OF SAMPLE (BGS / TOC)	14.88'
WELL DEPTH (BGS / TOC)	17.88' bb
WATER LEVEL (BGS / TOC)	11.90'
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=_____ gallons
For 2 inch wells: (TD-WL)x0.16=_____ gallons	For 4 inch wells: (TD-WL)x0.65=_____ gallons

APPEARANCE	sl turb gray - brn	→			

FIELD MEASUREMENTS					
VOLUME REMOVED ~~(GAL)~~ l	1.19 l	1.19	1.19	1.19	
TOTAL VOLUME REMOVED ~~(GAL)~~ l	1.19	2.38	3.57	4.76	
TEMPERATURE (°C or °F)	12.90	13.01	13.16	13.18	
CONDUCTIVITY (ATC, 25°C)	1.007	1.002	1.001	1.001	
pH	7.45	7.32	7.27	7.25	
REDOX (mV)	114.7	111.8	109.5	107.7	
DO (% / mg/L)	30.5 / 3.21	25.1/2.63	23.4/2.45	23.5/2.45	
PURGE OR SAMPLE	P	P	P	S	

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS	UF/UP					6 - 40 mL VOAs
SEMIVOLATILE ORGANICS	UF/UP					
LAB/DATE SUBMITTED						TA PACE 12/2/09

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SAMPLER'S INITIALS MJ/CH DATE 12/1/09

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FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Coleman Hoyt, Mike Jahn

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter - 100ft

GeoTech Geosub SS Pump # 2526 , GeoTech Buckbooster controller # 2570

GENERAL					
WELL/LOCATION	MW-7A				
WATER SOURCE	Groundwater				
DATE	12/1/09	→			
TIME	1402	1404	1406	1408	

SAMPLING CONDITIONS	
SAMPLING METHOD	Low Flow Purge with 1.5" X 12" submersible bladder pump
DEPTH OF SAMPLE (BGS / TOC)	21.6'
WELL DEPTH (BGS / TOC)	33.91'
WATER LEVEL (BGS / TOC)	9.32'
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=_____ gallons
For 2 inch wells: (TD-WL)x0.16=_____ gallons	For 4 inch wells: (TD-WL)x0.65=_____ gallons
APPEARANCE	sl turb brn →

FIELD MEASUREMENTS					
VOLUME REMOVED ~~(GAL)~~ l	1.34	1.34	1.34	1.34	
TOTAL VOLUME REMOVED ~~(GAL)~~ l	1.34	2.68	4.02	5.36	
TEMPERATURE (°C or °F)	11.93	12.34	12.54	12.50	
CONDUCTIVITY (ATC, 25°C)	0.974	0.985	1.004	1.014	
pH	7.51	7.52	7.51	7.49	
REDOX (mV)	135.7	131.0	126.9	123.1	
DO (% / mg/L)	29.1/3.11	20.9/2.19	13.6/1.42	8.1/0.86	
PURGE OR SAMPLE	P	P	P	S	

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS	UF/UP					3 - 40 mL VOAs
SEMIVOLATILE ORGANICS	UF/UP					
LAB/DATE SUBMITTED						TA - 12/2/09

EnviroGroup Limited

SAMPLER'S INITIALS MJ/CH DATE 12/1/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Coleman Hoyt, Mike Jahn

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter - 100ft

GeoTech Geosub SS Pump # 2526 , GeoTech Buckbooster controller # 2570

GENERAL					
WELL/LOCATION	EMW-06D + EMW-06D DUP				
WATER SOURCE	Groundwater				
DATE	12/1/09 →				
TIME	1455	1458	1502	1505	1507

SAMPLING CONDITIONS					
SAMPLING METHOD	Low Flow Purge with 1.5" X 12" submersible bladder pump				
DEPTH OF SAMPLE (BGS / TOC)	26.67'				
WELL DEPTH (BGS / TOC)	31.67'				
WATER LEVEL (BGS / TOC)	14.62'				
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=_____ gallons				
For 2 inch wells: (TD-WL)x0.16=_____ gallons	For 4 inch wells: (TD-WL)x0.65=_____ gallons				
APPEARANCE	mod turb brn →				

FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~) l	1.47	1.47	1.47	1.47	1.47
TOTAL VOLUME REMOVED (~~GAL~~) l	1.47	2.94	4.41	5.88	7.35
TEMPERATURE (°C or °F)	12.97	13.57	14.22	14.43	14.45
CONDUCTIVITY (ATC, 25°C)	4.781	4.948	5.191	5.246	2.548
pH	7.13	7.02	6.99	6.99	6.98
REDOX (mV)	135.6	126.6	107.2	89.1	83.0
DO (% / mg/L)	27.5/2.82	16.8/1.70	10.9/1.09	8.9/0.89	8.8/0.88
PURGE OR SAMPLE					

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
GROSS UF/UP					
DISSOLVED METALS F/HNO_3					
TOTAL METALS UF/HNO_3					
PETROLEUM HCs UF/HCl					
VOLATILE ORGANICS UF/UP					6 - 40 mL VOAs
SEMIVOLATILE ORGANICS UF/UP					
LAB/DATE SUBMITTED					TA - 12/2/09

EnviroGroup Limited

SAMPLER'S INITIALS MA/CH DATE 12/1/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Coleman Hoyt, Mike Jahn

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter - 100ft

GeoTech Geosub SS Pump # 2526 , GeoTech Buckbooster controller # 2570

GENERAL					
WELL/LOCATION	EMW-06S				
WATER SOURCE	Groundwater				
DATE	12/2/09	→	→		
TIME	0912	0914	0916		

SAMPLING CONDITIONS					
SAMPLING METHOD	Low Flow Purge with 1.5" X 12" submersible bladder pump				
DEPTH OF SAMPLE (BGS / TOC)	16.38				
WELL DEPTH (BGS / TOC)	18.08				
WATER LEVEL (BGS / TOC)	14.69				
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=_____ gallons				
For 2 inch wells: (TD-WL)x0.16=_____ gallons	For 4 inch wells: (TD-WL)x0.65=_____ gallons				
APPEARANCE	mod turb gray brn	→	→		

FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~) l	1.23	1.23	1.23		
TOTAL VOLUME REMOVED (~~GAL~~) l	1.23	2.46	~~2.46~~ cum 3.69		
TEMPERATURE (°C or °F)	14.94	15.09	15.19		
CONDUCTIVITY (ATC, 25°C)	2.561	2.546	2.542		
pH	7.11	7.09	7.08		
REDOX (mV)	164.4	164.0	163.8		
DO (% / mg/L)	37.4/3.73	38.0/3.81	39.0/3.89		
PURGE OR SAMPLE	P	P	S		

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS	UF/UP					3 - 40 mL VOAs
SEMIVOLATILE ORGANICS	UF/UP					
LAB/DATE SUBMITTED						TA 12/2/09

EnviroGroup Limited

SAMPLER'S INITIALS MJ/CH DATE 12/2/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ - Casper PCE Plume Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Coleman Hoyt, Mike Jahn

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI 556 with flow cell, EGL WL meter - 100ft

GeoTech Geosub SS Pump # 2526 , GeoTech Buckbooster controller # 2570

GENERAL					
WELL/LOCATION	EMW-07				
WATER SOURCE	Groundwater				
DATE	12/2/09	→	→		
TIME	0952	0954	0956		

SAMPLING CONDITIONS					
SAMPLING METHOD	Low Flow Purge with 1.5" X 12" submersible bladder pump				
DEPTH OF SAMPLE (BGS / TOC)	15.74'				
WELL DEPTH (BGS / TOC)	18.24- Soft Bottom				
WATER LEVEL (BGS / TOC)	12.55'				
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=_____ gallons				
	For 2 inch wells: (TD-WL)x0.16=_____ gallons		For 4 inch wells: (TD-WL)x0.65=_____ gallons		
APPEARANCE	med turb brn	→	→		

FIELD MEASUREMENTS					
VOLUME REMOVED ~~(GAL)~~ l	1.21	1.21	1.21		
TOTAL VOLUME REMOVED ~~(GAL)~~ l	1.21	2.42	3.63		
TEMPERATURE (°C or °F)	12.17	12.32	12.61		
CONDUCTIVITY (ATC, 25°C)	3.834	3.837	3.839		
pH	7.12	7.08	7.07		
REDOX (mV)	168.6	165.8	164.0		
DO (% / mg/L)	21.4 / 2.26	19.3 / 2.04	18.3 / 1.98		
PURGE OR SAMPLE	P	P	S		

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS	UF/UP					3 - 40 mL VOAs
SEMIVOLATILE ORGANICS	UF/UP					
LAB/DATE SUBMITTED						TA 12/2/09

EnviroGroup Limited

SAMPLER'S INITIALS MJ/CH DATE 12/2/09

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: ~~OLD SHERIDAN LANDFILL~~ Casper PCE LOCATION: CASPER, WY

PROJECT NO. WQ-0664 PERSONNEL: MAJ

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) IN-SITU YSI 556 (RENTAL/EGL), WL METER (EGL) SUB-PUMP

GENERAL					
WELL ID/LOCATION	EMW-11				
WATER SOURCE	GROUNDWATER				
DATE	8/11/10	→	→	→	→
TIME	1030	1031	1033	1034	1035

SAMPLING CONDITIONS					
SAMPLING METHOD	SUBMERSIBLE LOW-FLOW PUMP				
DEPTH OF SAMPLE (BTOC)	~ 9.5'				
WELL DEPTH (BTOC)	12.15' slb				
WATER LEVEL (BTOC)	7.05'				
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04= gallons				
For 2 inch wells: (TD-WL)x0.16= 0.8 gallons	For 4 inch wells: (TD-WL)x0.65= gallons				
APPEARANCE	clear	med tan brn	→	→	→

FIELD MEASUREMENTS					
VOLUME REMOVED (GAL)	INITIAL	0.8	0.8	0.8	0.8
TOTAL VOLUME REMOVED (GAL)	INITIAL	0.8	1.6	2.4	3.2
TEMPERATURE (°C or °F)	18.60	15.57	15.22	15.13	15.08
CONDUCTIVITY (ATC, 25°C)	1.674	1.716	1.726	1.729	1.734
pH	7.80	7.46	7.34	7.28	7.24
REDOX (mV)	173.8	179.6	185.5	189.6	193.4
DO (% / mg/L)	48.3 14.46	34.4 13.39	3,36 13.33	32.2 13.22	31.7 13.17
PURGE OR SAMPLE	P	P	P	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
8260B VOCS (HCL PRESERVED)					3 - Bottles
OTHER					- Bottles
OTHER					- Bottles
OTHER					- Bottles
OTHER					
OTHER					
LAB/DATE SUBMITTED					TA 8/11/10

EnviroGroup Limited

SAMPLER'S INITIALS MJ DATE 8/11/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: ~~OLD SHERIDAN LANDFILL~~ Casper PCE LOCATION: CASPER, WY

PROJECT NO. WQ-0664 PERSONNEL: MAJ

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) IN-SITU YSI 556 (RENTAL (EGL)), WL METER (EGL) SUB-PUMP

GENERAL					
WELL ID/LOCATION	EMW-12				
WATER SOURCE	GROUNDWATER				
DATE	8/11/10	→	→	→	→
TIME	1114	1115	1117	1119	1120

SAMPLING CONDITIONS					
SAMPLING METHOD	SUBMERSIBLE LOW-FLOW PUMP				
DEPTH OF SAMPLE (BTOC)	~12'				
WELL DEPTH (BTOC)	13.51'				
WATER LEVEL (BTOC)	10.30'				
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04= — gallons				
	For 2 inch wells: (TD-WL)x0.16= 0.5 gallons		For 4 inch wells: (TD-WL)x0.65= — gallons		
APPEARANCE	clear	mod turb brn	→	sl. turb brn	→

FIELD MEASUREMENTS					
VOLUME REMOVED (GAL)	INITIAL	0.5	0.5	0.5	0.5
TOTAL VOLUME REMOVED (GAL)	INITIAL	0.5	1.0	1.5	2.0
TEMPERATURE (°C or °F)	18.69	16.83	15.91	15.58	15.55
CONDUCTIVITY (ATC, 25°C)	4.583	4.592	4.523	4.454	4.416
pH	7.05	6.90	6.82	6.78	6.77
REDOX (mV)	230.7	240.2	243.6	244.1	243.5
DO (% / mg/L)	59.1 / 5.48	36.8 / 3.49	29.2 / 2.84	25.6 / 2.51	23.7 / 2.32
PURGE OR SAMPLE	P	P	P	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
8260B VOCS (HCL PRESERVED)					3 - Bottles
OTHER					- Bottles
OTHER					- Bottles
OTHER					- Bottles
OTHER					
OTHER					
LAB/DATE SUBMITTED					TA 8/11/10

EnviroGroup Limited

SAMPLER'S INITIALS MG DATE 8/11/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: ~~OLD SHERIDAN LANDFILL~~ Casper PCE LOCATION: CASPER, WY

PROJECT NO. WQ-0664 PERSONNEL: MAJ

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) IN-SITU YSI 556 (RENTAL/EGL), WL METER (EGL) SUB-PUMP

GENERAL					
WELL ID/LOCATION	EMW-13				
WATER SOURCE	GROUNDWATER				
DATE	8/11/10	→	→	→	→
TIME	1157	1159	1201	1202	

SAMPLING CONDITIONS					
SAMPLING METHOD	SUBMERSIBLE LOW-FLOW PUMP				
DEPTH OF SAMPLE (BTOC)	~ 13.5				
WELL DEPTH (BTOC)	16.11'				
WATER LEVEL (BTOC)	10.98'				
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=____ gallons				
For 2 inch wells: (TD-WL)x0.16= 0.8 gallons	For 4 inch wells: (TD-WL)x0.65=____ gallons				
APPEARANCE	clear	mod turb brn	→	sl. turb - cloudy brn	

FIELD MEASUREMENTS					
VOLUME REMOVED (GAL)	INITIAL	0.8	0.8	0.8	
TOTAL VOLUME REMOVED (GAL)	INITIAL	0.8	1.6	2.4	
TEMPERATURE (°C or °F)	26.02	17.97	17.03	17.00	
CONDUCTIVITY (ATC, 25°C)	2.908	2.790	2.752	2.749	
pH	7.36	6.97	6.81	6.74	
REDOX (mV)	190.3	147.8	141.0	135.6	
DO (% / mg/L)	14.9 / 1.30	17.8 / 1.71	28.0 / 2.70	30.4 / 2.91	/
PURGE OR SAMPLE	P	P	P	S	

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
8260B VOCS (HCL PRESERVED)					3 - Bottles
OTHER					- Bottles
OTHER					- Bottles
OTHER					- Bottles
OTHER					
OTHER					
LAB/DATE SUBMITTED					TA 8/11/10

EnviroGroup Limited

SAMPLER'S INITIALS MJ DATE 8/11/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: ~~OLD SHERIDAN LANDFILL~~ Casper PCE LOCATION: CASPER, WY

PROJECT NO. WQ-0664 PERSONNEL: MAJ

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) IN-SITU YSI 556 (RENTAL/EGL), WL METER (EGL) SUB-PUMP

GENERAL					
WELL ID/LOCATION	EMW-14				
WATER SOURCE	GROUNDWATER				
DATE	8/11/10	→	→	→	
TIME	1233	1234	1237	1239	

SAMPLING CONDITIONS					
SAMPLING METHOD	SUBMERSIBLE LOW-FLOW PUMP				
DEPTH OF SAMPLE (BTOC)	~12'				
WELL DEPTH (BTOC)	13.52				
WATER LEVEL (BTOC)	9.55'				
ONE WET CASING VOLUME			For 1 inch wells: (TD-WL)x0.04= — gallons		
For 2 inch wells: (TD-WL)x0.16= 0.6 gallons			For 4 inch wells: (TD-WL)x0.65= — gallons		
APPEARANCE	mod to very turb brn	→	→	mod turb brn	

FIELD MEASUREMENTS					
VOLUME REMOVED (GAL)	INITIAL	0.6	0.6	0.6	
TOTAL VOLUME REMOVED (GAL)	INITIAL	0.6	1.2	1.8	
TEMPERATURE (°C or °F)	21.82	19.34	18.91	18.61	
CONDUCTIVITY (ATC, 25°C)	3.361	3.447	3.339	3.364	
pH	7.26	7.09	6.95	6.90	
REDOX (mV)	147.0	152.9	159.9	161.8	
DO (% / mg/L)	60.5 / 5.35	58.2 / 5.33	56.7 / 5.20	56.5 / 5.18	/
PURGE OR SAMPLE	P	P	P	S	

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
8260B VOCS (HCL PRESERVED)					3 - Bottles
OTHER					- Bottles
OTHER					- Bottles
OTHER					- Bottles
OTHER					
OTHER					
LAB/DATE SUBMITTED					TA 8/11/10

EnviroGroup Limited

SAMPLER'S INITIALS MJ DATE 8/11/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: ~~OLD SHERIDAN LANDFILL~~ Casper PCE LOCATION: CASPER, WY

PROJECT NO. WQ-0664 PERSONNEL: MAJ

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) IN-SITU YSI 556 (RENTAL/EGL), WL METER (EGL) SUB-PUMP

GENERAL					
WELL ID/LOCATION	EMW-10				
WATER SOURCE	GROUNDWATER				
DATE	8/11/10				
TIME	1330	1331	1333	1335	1337

SAMPLING CONDITIONS					
SAMPLING METHOD	SUBMERSIBLE LOW-FLOW PUMP				
DEPTH OF SAMPLE (BTOC)	~24				
WELL DEPTH (BTOC)	26.12				
WATER LEVEL (BTOC)	21.74'				
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04= — gallons				
	For 2 inch wells: (TD-WL)x0.16= 0.7 gallons		For 4 inch wells: (TD-WL)x0.65= — gallons		
APPEARANCE	mod, to very turb brn	~~mod~~ →	mod turb grey-brn	cloudy brn	→

FIELD MEASUREMENTS					
VOLUME REMOVED (GAL)	INITIAL	0.7	0.7	0.7	0.7
TOTAL VOLUME REMOVED (GAL)	INITIAL	0.7	1.4	2.1	2.8
TEMPERATURE (°C or °F)	22.42	17.78	16.35	16.08	16.02
CONDUCTIVITY (ATC, 25°C)	3,047	3,138	3,089	3,109	3,120
pH	7.46	7.33	7.14	7.01	6.98
REDOX (mV)	149.3	155.0	165.7	170.9	172.2
DO (% / mg/L)	84.0 / 7.29	70.5 / 6.69	63.0 / 6.11	60.5 / 5.89	59.1 / 5.78
PURGE OR SAMPLE	P	P	P	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
8260B VOCS (HCL PRESERVED)					3 - Bottles
OTHER					- Bottles
OTHER					- Bottles
OTHER					- Bottles
OTHER					
OTHER					
LAB/DATE SUBMITTED					TA 8/11/10

EnviroGroup Limited

SAMPLER'S INITIALS MJ DATE 8/11/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: ~~OLD SHERIDAN LANDFILL~~ Casper PCE LOCATION: CASPER, WY

PROJECT NO. WQ-0664 PERSONNEL: MAJ

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) IN-SITU YSI 556 (RENTAL/EGL), WL METER (EGL) SUB-PUMP

GENERAL					
WELL ID/LOCATION	EMW-08 + EMW-08 DUP				
WATER SOURCE	GROUNDWATER				
DATE	8/11/10	→		→	
TIME	1406	1408	1411	1412	

SAMPLING CONDITIONS					
SAMPLING METHOD	SUBMERSIBLE LOW-FLOW PUMP				
DEPTH OF SAMPLE (BTOC)	~ 7 ft				
WELL DEPTH (BTOC)	9.58' bb				
WATER LEVEL (BTOC)	4.65'				
ONE WET CASING VOLUME			For 1 inch wells: (TD-WL)x0.04= ___ gallons		
For 2 inch wells: (TD-WL)x0.16= 0.8 gallons			For 4 inch wells: (TD-WL)x0.65= ___ gallons		
APPEARANCE	very turb dark brn	→	mod turb grey-brn	Cloudy brown	

FIELD MEASUREMENTS					
VOLUME REMOVED (GAL)	INITIAL	0.8	0.8	0.8	
TOTAL VOLUME REMOVED (GAL)	INITIAL	0.8	1.6	2.4	
TEMPERATURE (°C or °F)	24.03	21.00	20.74	20.62	
CONDUCTIVITY (ATC, 25°C)	2.965	2.969	2.802	2.729	
pH	7.11	6.91	6.74	6.71	
REDOX (mV)	150.5	159.9	168.6	168.7	
DO (% / mg/L)	53.9 / 4.27	26.0 / 2.31	31.1 / 2.77	32.4 / 2.89	/
PURGE OR SAMPLE	P	P	P	S	

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
8260B VOCS (HCL PRESERVED)					6 - Bottles
OTHER					- Bottles
OTHER					- Bottles
OTHER					- Bottles
OTHER					
OTHER					
LAB/DATE SUBMITTED					TA 8/11/10

EnviroGroup Limited

SAMPLER'S INITIALS MJ DATE 8/11/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: ~~OLD SHERIDAN LANDFILL~~ Casper PCE LOCATION: CASPER, WY

PROJECT NO. WQ-0664 PERSONNEL: MAJ

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) IN-SITU YSI 556 (RENTAL/EGL), WL METER (EGL) SUB-PUMP

GENERAL					
WELL ID/LOCATION	EMW-09				
WATER SOURCE	GROUNDWATER				
DATE	8/11/10 →				
TIME	1442	1444	1445	1447	1449

SAMPLING CONDITIONS					
SAMPLING METHOD	SUBMERSIBLE LOW-FLOW PUMP				
DEPTH OF SAMPLE (BTOC)	~ 16 ft				
WELL DEPTH (BTOC)	17.71'				
WATER LEVEL (BTOC)	14.55'				
ONE WET CASING VOLUME			For 1 inch wells: (TD-WL)x0.04= — gallons		
For 2 inch wells: (TD-WL)x0.16= 0.5 gallons			For 4 inch wells: (TD-WL)x0.65= — gallons		
APPEARANCE	very turb brn	→	→	mod turb brn	cloudy brn

FIELD MEASUREMENTS					
VOLUME REMOVED (GAL)	INITIAL	0.5	0.5	0.5	0.5
TOTAL VOLUME REMOVED (GAL)	INITIAL	0.5	1.0	1.5	2.0
TEMPERATURE (°C or °F)	25.09	20.09	19.05	18.77	18.79
CONDUCTIVITY (ATC, 25°C)	2.756	2.781	2.770	2.767	2.779
pH	7.67	7.44	7.22	7.12	7.09
REDOX (mV)	134.6	139.4	148.2	151.8	152.0
DO (% / mg/L)	78.5 / 6.48	60.2 / 5.41	59.8 / 5.50	59.4 / 5.51	58.2 / 5.32
PURGE OR SAMPLE	P	P	P	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
8260B VOCS (HCL PRESERVED)					3 - Bottles
OTHER					- Bottles
OTHER					- Bottles
OTHER					- Bottles
OTHER					
OTHER					
LAB/DATE SUBMITTED					TA 8/11/10

EnviroGroup Limited

SAMPLER'S INITIALS MJ DATE 8/11/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ-Casper Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 GW PERSONNEL: CWH / CW

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI-556 Meter, EGL WL Meter, GeoSub Pump

GENERAL						
WELL/LOCATION	EMW - 25					
WATER SOURCE	GROUNDWATER					
DATE	12/15/10	→	→	→	→	→
TIME	1140	1145	1150	1153	1156	1159
SAMPLING CONDITIONS						
SAMPLING METHOD GeoSub Submersible Pump — low flow sampling						
DEPTH OF SAMPLE (BGS / TOC)	31.05'					
WELL DEPTH (BGS / TOC)	23.87'					
WATER LEVEL (BGS / TOC)	15.23'					
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= N/A gallons			For 1 inch wells: (TD-WL)x0.04= N/A gallons; For 4 inch wells: (TD-WL)x0.65= N/A gallons			
APPEARANCE	Cloudy from low flow	→	Clear	→	→	→
FIELD MEASUREMENTS						
VOLUME REMOVED (~~GAL~~ Liters)	0	2	1.1	1.1	1.1	1.1
TOTAL VOLUME REMOVED (~~GAL~~ Liters)	0	2	3.1	4.2	5.3	6.4
TEMPERATURE (°C or °F)	15.16	15.9	15.85	15.80	15.84	15.37
CONDUCTIVITY (ATC, 25°C)	3.088	3.052	3.044	3.046	3.044	3.045
pH	7.43	7.46	7.43	7.43	7.43	7.42
REDOX (mV)	224.6	212.4	199.4	195.1	189.4	186.7
DISSOLVED OXYGEN (% / mg/L)	84.4 / 8.36	69.61 / 6.80	61.41 / 6.01	59.9 / 5.88	59.7 / 5.87	60.0 / 5.97
PURGE OR SAMPLE	P	P	P	P	~~CWH~~ P	S
SAMPLES COLLECTED AND SAMPLE ANALYSIS						
VOLATILE ORGANICS	UF/UP HCl				3 -40 mL VOAs	
LAB/DATE SUBMITTED				TA- 12/17/10	PACE- ~~12/17/10~~ NA	

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SAMPLER'S INITIALS CWH DATE 12/15/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ-Casper Orphan Site LOCATION: Casper, WY

PROJECT NO.: WQ-0664 GW PERSONNEL: CWH / CW

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI-556 Meter, EGL WL Meter, GeoSub Pump

GENERAL					
WELL/LOCATION	EMW-26				
WATER SOURCE	GROUNDWATER				
DATE	12/15/10	→	→	→	→
TIME	1246	1250	1253	1256	1259

SAMPLING CONDITIONS					
SAMPLING METHOD GeoSub Submersible Pump - low flow sampling					
DEPTH OF SAMPLE (BGS / TOC) 17.94					
WELL DEPTH (BGS / TOC) 21.30					
WATER LEVEL (BGS / TOC) 14.58					
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= N/A gallons			For 1 inch wells: (TD-WL)x0.04= N/A gallons For 4 inch wells: (TD-WL)x0.65= N/A gallons		
APPEARANCE	v.c. tan v.c. turb	→	Clear	→	→

FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~ Liters)	0.	1.5	1.5	1.5	1.5
TOTAL VOLUME REMOVED (~~GAL~~ L)	0	1.5	3.0	4.5	6.0
TEMPERATURE (°C or °F)	15.37	15.95	16.04	16.07	16.05
CONDUCTIVITY (ATC, 25°C)	2.348	2.345	2.335	2.329	2.323
pH	7.49	7.48	7.47	7.47	7.46
REDOX (mV)	111.2	14.0	-4.4	-7.8	-8.5
DISSOLVED OXYGEN (% / mg/L)	35.4 / 3.79	34.1 / 3.35	35.8 / 3.51	35.7 / 3.49	32.7 / 3.29
PURGE OR SAMPLE	P	P	P	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
VOLATILE ORGANICS UF/OP' MW Hydro HCL					3 -40 mL VOAs
					Cwh
LAB/DATE SUBMITTED				TA- 12/17/10	PACE- ~~12/17/10~~ N/A

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SAMPLER'S INITIALS CWH DATE 12/15/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ-Casper Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 GW PERSONNEL: CWH / CW

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI-556 Meter, EGL WL Meter, GeoSub Pump

GENERAL					
WELL/LOCATION	EMW-27				
WATER SOURCE	GROUNDWATER				
DATE	12/15/10	→	→	→	→
TIME	1339	1344	1346	1348	1350

SAMPLING CONDITIONS					
SAMPLING METHOD GeoSub Submersible Pump – low flow sampling					
DEPTH OF SAMPLE (BGS / TOC) 11.83					
WELL DEPTH (BGS / TOC) 13.72					
WATER LEVEL (BGS / TOC) 9.94					
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= N/A gallons			For 1 inch wells: (TD-WL)x0.04=____N/A___ gallons For 4 inch wells: (TD-WL)x0.65=____N/A___gallons		
APPEARANCE	v.l. brown v.l. turb	→	→	Clear	→

FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~ L)	1	4	CAW ~~5.6~~ 1.6	CAW ~~7.2~~ 1.6	~~8.8~~ 1.6 CAW
TOTAL VOLUME REMOVED (~~GAL~~ L)	1	5	6.6	8.2	9.8
TEMPERATURE (°C or °F)	12.31	13.98	14.11	14.14	14.17
CONDUCTIVITY (ATC, 25°C)	2.360	2.332	2.330	2.332	2.335
pH	7.15	7.15	7.15	7.16	7.15
REDOX (mV)	63.0	19.5	19.1	15.9	22.9
DISSOLVED OXYGEN (% / mg/L)	89.4 / 9.58	58.7 / 5.94	39.2 / 3.97	33.8 / 3.44	31.7 / 3.43
PURGE OR SAMPLE	P	P	P	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
VOLATILE ORGANICS UF/~~UP~~ HCL	1/[illegible]				3 -40 mL VOAs
					CAW
LAB/DATE SUBMITTED				TA-12/17/10	PACE- ~~12/17/10~~ N/A

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SAMPLER'S INITIALS CWH DATE 12/15/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ-Casper Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 GW PERSONNEL: CWH / CW

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI-556 Meter, EGL WL Meter, GeoSub Pump

GENERAL					
WELL/LOCATION	EMW-16				
WATER SOURCE	GROUNDWATER				
DATE	12/15/10 →				
TIME	1436	1242	1444	1446	1448
SAMPLING CONDITIONS					
SAMPLING METHOD GeoSub Submersible Pump - low flow sampling					
DEPTH OF SAMPLE (BGS / TOC) 13.17					
WELL DEPTH (BGS / TOC) 15.85					
WATER LEVEL (BGS / TOC) 10.49					
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= N/A gallons			For 1 inch wells: (TD-WL)x0.04=____N/A___ gallons For 4 inch wells: (TD-WL)x0.65=____N/A___gallons		
APPEARANCE	L. Brn. L. Turb →		clear →		
FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~ L)	1	4.8	1.6	1.6	1.6
TOTAL VOLUME REMOVED (~~GAL~~ L)	1	5.8	7.4	9.0	10.6
TEMPERATURE (°C or °F)	12.01	13.07	13.14	1332	1329
CONDUCTIVITY (ATC, 25°C)	2.321	2.314	2.298	2.306	2.314 ✓
pH	7.16	7.10	7.06	7.08	7.08 ✓
REDOX (mV)	-5.8	-8.1	-5.3	-3.0	-1.0
DISSOLVED OXYGEN (% / mg/L)	24.3 / 2.56	11.9 / 1.23	11.1 / 1.16	10.9 / 1.12	10.3 / 1.07 ✓
PURGE OR SAMPLE	P	P	P	P	S
SAMPLES COLLECTED AND SAMPLE ANALYSIS					
VOLATILE ORGANICS UF/~~UP~~ HCL					3 -40 mL VOAs
					Cwh
LAB/DATE SUBMITTED				TA- 12/17/10	PACE- ~~12/17/10~~ N/A

EnviroGroup Limited

SAMPLER'S INITIALS Cwh DATE 12/15/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ-Casper Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 GW PERSONNEL: CWH / CW

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI-556 Meter, EGL WL Meter, GeoSub Pump

GENERAL						
WELL/LOCATION	EMW-17					
WATER SOURCE	GROUNDWATER					
DATE	12/16/10 →					
TIME	1141	1145	1147	1150	1153	1156
SAMPLING CONDITIONS						
SAMPLING METHOD GeoSub Submersible Pump – Low flow sampling						
DEPTH OF SAMPLE (BGS / TOC)	9.5'					
WELL DEPTH (BGS / TOC)	12.93					
WATER LEVEL (BGS / TOC)	6.07					
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= N/A gallons			For 1 inch wells: (TD-WL)x0.04=___N/A___ gallons For 4 inch wells: (TD-WL)x0.65=___N/A___gallons			
APPEARANCE	Clear →					
FIELD MEASUREMENTS						
VOLUME REMOVED (~~GAL~~ L)	1	2	1	1.5	1.5	1.5
TOTAL VOLUME REMOVED (~~GAL~~ L)	1	3	4	5.5	7.0	8.5
TEMPERATURE (°C or °F)	9.39	10.38	10.57	10.79	10.90	10.90
CONDUCTIVITY (ATC, 25°C)	2.105	2.057	2.069	2.074	2.095	2.095
pH	6.80	7.15	7.24	7.34	7.37	7.35
REDOX (mV)	24.9	-57.6	-61.0	-52.5	-42.2	-36.1
DISSOLVED OXYGEN (% / mg/L)	300 / 31.0	114.5 / 12.64	72.5 / 7.82	55.4 / 6.07	122.1 / 13.00	481.0 / 50.2
PURGE OR SAMPLE	P	P	P	P	S	↓
SAMPLES COLLECTED AND SAMPLE ANALYSIS						
VOLATILE ORGANICS	UF/~~UP~~ HCL				3 -40 mL VOAs	1158
						1
						9.5
						1094
						2.091
						7.39
						-31.2
LAB/DATE SUBMITTED				TA- 12/17/10	PACE- ~~12/17~~ CWH	325 / 34

EnviroGroup Limited

SAMPLER'S INITIALS CWH DATE 12/16/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ-Casper Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 GW\ PERSONNEL: CWH / CW

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI-556 Meter, EGL WL Meter, GeoSub Pump

GENERAL						
WELL/LOCATION	EMW-18, EMW-18 DUP					
WATER SOURCE	GROUNDWATER					
DATE	12/16/10 →					
TIME	1247	1250	1252	1254	1256	1258
SAMPLING CONDITIONS						
SAMPLING METHOD GeoSub Submersible Pump – Low flow sampling						
DEPTH OF SAMPLE (BGS / TOC) 9.14						
WELL DEPTH (BGS / TOC) 12.27						
WATER LEVEL (BGS / TOC) 6.01						
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= N/A gallons			For 1 inch wells: (TD-WL)x0.04=____N/A___ gallons For 4 inch wells: (TD-WL)x0.65=____N/A___gallons			
APPEARANCE	V. L. Brn. V. L. Turb →					
FIELD MEASUREMENTS						
VOLUME REMOVED (~~GAL~~ L)	1	1.5	1	1	1	1
TOTAL VOLUME REMOVED (~~GAL~~ L)	1	25	3.5	4.5	5.5	6.5
TEMPERATURE (°C or °F)	11.97	11.53	11.66	11.89	12.07	12.12
CONDUCTIVITY (ATC, 25°C)	2.743	2.751	2.735	2.734	2.739	2.737
pH	7.14	6.95	6.97	7.01	7.04	7.09
REDOX (mV)	83.8	86.6	80.7	71.2	67.4	65.0
DISSOLVED OXYGEN (% / mg/L)	116.2 / 11.48	62.5 / 6.70	48.1 / 5.13	39.3 / 4.18	32.4 / 2.94	28.0 / 2.98
PURGE OR SAMPLE	P	P	P	P	S	↓
SAMPLES COLLECTED AND SAMPLE ANALYSIS						
VOLATILE ORGANICS UF/~~UP~~ HCL					6 -40 mL VOAs	1300
						1
						7.5
						12.17
						2.739
						7.10
					Cum	65.2
LAB/DATE SUBMITTED				TA- 12/17/10	PACE- ~~12/17/10~~ NP	26.3 / 2.79

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SAMPLER'S INITIALS Cwh DATE 12/16/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ-Casper Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 GW PERSONNEL: CWH / CW

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI-556 Meter, EGL WL Meter, GeoSub Pump

GENERAL						
WELL/LOCATION	EMW-19, EMW-19 REP					
WATER SOURCE	GROUNDWATER					
DATE	12/16/10					
TIME	1326	1328	1330	1332	1334	1336
SAMPLING CONDITIONS						
SAMPLING METHOD GeoSub Submersible Pump – Low flow sampling						
DEPTH OF SAMPLE (BGS / TOC) 10.32						
WELL DEPTH (BGS / TOC) 12.74						
WATER LEVEL (BGS / TOC) 7.91						
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= N/A gallons			For 1 inch wells: (TD-WL)x0.04=____N/A___ gallons For 4 inch wells: (TD-WL)x0.65=____N/A___gallons			
APPEARANCE	V.L. Brown. V.L. tan					
FIELD MEASUREMENTS						
VOLUME REMOVED (~~GAL~~ L)	1	0.8	0.8	0.8	0.8	0.8
TOTAL VOLUME REMOVED (~~GAL~~ L)	1	1.8	2.6	3.4	4.2	5.0
TEMPERATURE (°C or °F)	9.83	10.50	10.76	11.16	11.26	11.32
CONDUCTIVITY (ATC, 25°C)	2.415	2.544	2.555	2.579	2.616	✓ 2.621
pH	7.17	7.00	7.06	~~6.9~~ 7.08	7.07	✓ 7.11
REDOX (mV)	96.0	85.0	77.9	69.9 ~~[illegible]~~	68.7	58.2
DISSOLVED OXYGEN (% / mg/L)	132.8/14.10	72.0/7.85	60.8/6.71	54.5/5.92	48.5/5.64	✓ 47.8/5.30
PURGE OR SAMPLE	P	P	P	P	S	
SAMPLES COLLECTED AND SAMPLE ANALYSIS						
VOLATILE ORGANICS UF/~~UP~~ HCL	[illegible]				6 -40 mL VOAs	
LAB/DATE SUBMITTED				TA- 12/17/10	PACE- 12/17/10	

EnviroGroup Limited

SAMPLER'S INITIALS ~~12/16/10~~ Cwh Cwh DATE 12/16/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ-Casper Orphan Site LOCATION: Casper, WY

PROJECT NO.: WQ-0664 GW PERSONNEL: CWH / CW

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI-556 Meter, EGL WL Meter, GeoSub Pump

GENERAL						
WELL/LOCATION	EMW-15					
WATER SOURCE	GROUNDWATER					
DATE	12/16/10					
TIME	1409	1411	1414	1417	1420	1423
SAMPLING CONDITIONS						
SAMPLING METHOD GeoSub Submersible Pump – Low flow sampling						
DEPTH OF SAMPLE (BGS / TOC) 18.08						
WELL DEPTH (BGS / TOC) ~~15.21~~ CWH 20.88						
WATER LEVEL (BGS / TOC) 15.21						
ONE WET CASING VOLUME For 1 inch wells: (TD-WL)x0.04=____N/A___ gallons For 2 inch wells: (TD-WL)x0.16= N/A gallons For 4 inch wells: (TD-WL)x0.65=____N/A___gallons						
APPEARANCE	light BBA. low turb					
FIELD MEASUREMENTS						
VOLUME REMOVED (~~GAL~~) L	1.1	1.1	1.1	1.1	1.1	1.1
TOTAL VOLUME REMOVED (~~GAL~~) L	1.1	2.2	3.3	4.4	5.5	6.6
TEMPERATURE (°C or °F)	11.25	11.97	11.43	12.77	12.85	12.82
CONDUCTIVITY (ATC, 25°C)	3.883	3.930	3.944	3.936	3.945	3.947
pH	7.21	7.21	7.19	7.18	7.19	7.18
REDOX (mV)	111.0	96.5	90.3	80.5	74.3	70.7
DISSOLVED OXYGEN (% / mg/L)	87.0 / 9.33	76.5 / 8.11	64.7 / 5.85	41.9 / 4.34	32.6 / 2.38	26.0 / 2.37
PURGE OR SAMPLE	P	P	P	P	S	↓
SAMPLES COLLECTED AND SAMPLE ANALYSIS						
VOLATILE ORGANICS UF/~~UP~~ HCL Ave 4 wks					3 -40 mL VOAs	1426
						1.1
						7.7
						12.78
						3.945
						7.18
						68.4
LAB/DATE SUBMITTED				TA- 12/17/10	PACE- N/A	22.8 / 2.38

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SAMPLER'S INITIALS ~~12/15/10~~ Cwh Cwh DATE 12/16/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ-Casper Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 GW PERSONNEL: CWH / CW

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI-556 Meter, EGL WL Meter, GeoSub Pump

GENERAL						
WELL/LOCATION	EMW-20					
WATER SOURCE	GROUNDWATER					
DATE	12/16/10					
TIME	1505	1503	1510	1512	1514	1516

SAMPLING CONDITIONS	
SAMPLING METHOD GeoSub Submersible Pump - Low flow sampling	
DEPTH OF SAMPLE (BGS / TOC)	15.61
WELL DEPTH (BGS / TOC)	18.51
WATER LEVEL (BGS / TOC)	12.70
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=___N/A___ gallons
For 2 inch wells: (TD-WL)x0.16=___N/A___ gallons	For 4 inch wells: (TD-WL)x0.65=___N/A___ gallons

FIELD MEASUREMENTS						
APPEARANCE	Clear					
VOLUME REMOVED (GAL)	1	1.5	1	1	1	1
TOTAL VOLUME REMOVED (GAL)	1	2.5	3.5	4.5	5.5	6.5
TEMPERATURE (°C or °F)	12.5	13.10	13.26	13.26	13.02	13.05
CONDUCTIVITY (ATC, 25°C)	2.504	2.917	2.990	3.030	3.048	3.059
pH	7.21	7.04	7.09	7.14	7.14	7.14
REDOX (mV)	152.4	118.5	93.0	79.8	73.1	73.8
DISSOLVED OXYGEN (% / mg/L)	25.8 / 2.71	14.5 / 1.50	13.3 / 1.36	12.0 / 1.25	10.9 / 1.14	10.6 / 1.10
PURGE OR SAMPLE	P	P	P	P	S	

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
VOLATILE ORGANICS	UF/~~UP~~ HCL				3 -40 mL VOAs
LAB/DATE SUBMITTED				TA- 12/17/10	PACE- N/A

EnviroGroup Limited

SAMPLER'S INITIALS CWH DATE 12/16/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ-Casper Orphan Site LOCATION: Casper, WY

PROJECT NO.: WQ-0664 GW PERSONNEL: CWH / CW

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI-556 Meter, EGL WL Meter, GeoSub Pump

GENERAL						
WELL/LOCATION	EMW-22					
WATER SOURCE	GROUNDWATER					
DATE	12/16/10					
TIME	1546	1550	1553	1555	1557	1559

SAMPLING CONDITIONS						
SAMPLING METHOD GeoSub Submersible Pump — Low flow sampling						
DEPTH OF SAMPLE (BGS / TOC) 13.6						
WELL DEPTH (BGS / TOC) 16.59						
WATER LEVEL (BGS / TOC) 10.32						
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= N/A gallons			For 1 inch wells: (TD-WL)x0.04=____N/A___ gallons For 4 inch wells: (TD-WL)x0.65=____N/A___gallons			
APPEARANCE	V.L. Brown. V.L. turb.		Clear			

FIELD MEASUREMENTS						
VOLUME REMOVED (GAL) L	1.5	2.5	1.5	1.5	1.5	1.5
TOTAL VOLUME REMOVED (GAL) L	1.5	4.0	5.5	7.0	8.5	10.0
TEMPERATURE (°C or °F)	12.57	12.91	13.12	13.15	13.16	13.18
CONDUCTIVITY (ATC, 25°C)	1.512	1.503	1.503	1.502	1.503	1.502
pH	7.33	7.30	7.31	7.29	7.27	7.28
REDOX (mV)	102.1	72.1	59.9	52.1	49.3	45.3
DISSOLVED OXYGEN (% / mg/L)	137.2 / 14.40	32.9 / 3.42	20.6 / 2.16	18.4 / 1.91	17.3 / 1.80	16.9 / 1.75
PURGE OR SAMPLE	P	P	P	P	S	

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
VOLATILE ORGANICS UF/~~UP~~ HCL	MW 1/20/11				3 -40 mL VOAs
LAB/DATE SUBMITTED				TA- 12/17/10	PACE- N/A

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SAMPLER'S INITIALS CWH DATE 12/16/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ-Casper Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 GW PERSONNEL: CWH / CW

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI-556 Meter, EGL WL Meter, GeoSub Pump

GENERAL						
WELL/LOCATION	EMW-21, EMW-21 DUP					
WATER SOURCE	GROUNDWATER					
DATE	12/16/10					
TIME	1623	1625	1629	1631	1633	1635
SAMPLING CONDITIONS						
SAMPLING METHOD GeoSub Submersible Pump – low flow sampling						
DEPTH OF SAMPLE (BGS / TOC) 11.7						
WELL DEPTH (BGS / TOC) 14.38						
WATER LEVEL (BGS / TOC) 9.02						
ONE WET CASING VOLUME For 1 inch wells: (TD-WL)x0.04=____N/A___ gallons For 2 inch wells: (TD-WL)x0.16=___N/A___ gallons For 4 inch wells: (TD-WL)x0.65=____N/A___gallons						
APPEARANCE	Clear					
FIELD MEASUREMENTS						
VOLUME REMOVED (~~GAL~~ L)	1	0.4	2.8	1.4 ~~gal~~ CAW	1.4	1.4
TOTAL VOLUME REMOVED (~~GAL~~ L)	1	2.4	5.2	6.6	8.0	9.4
TEMPERATURE (°C or °F)	11.56	11.86	12.09	12.08	12.12	12.14
CONDUCTIVITY (ATC, 25°C)	1.424	1.427	1.429	1.429	1.427	1.429
pH	7.19	7.22	7.27	7.28	7.29	7.27
REDOX (mV)	21.9	15.7	4.3	-1.6	-3.3	-4.0
DISSOLVED OXYGEN (% / mg/L)	205.2 / 20.56	239.5 / 24.59	82.3 / 8.76	53.6 / 5.70	51.2 / 5.45	46.5 / 5.00
PURGE OR SAMPLE	P	P	P	P	S	
SAMPLES COLLECTED AND SAMPLE ANALYSIS						1637
VOLATILE ORGANICS UF/~~UP~~ ACL	Mw 4/0/11				6 -40 mL VOAs	1.4
						10.8
						12.15
						1.429
						7.29
						-7.6
						44.1 / 4.71
						1639
LAB/DATE SUBMITTED				TA- 12/17/10	PACE- N/A	1.4
						12.2
						12.13
						1.429
						7.27
						-7.8
						42.2 / 4.50

EnviroGroup Limited

SAMPLER'S INITIALS 12/16/10 DATE CWH

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ-Casper Orphan Site LOCATION: Casper, WY

PROJECT NO. WQ-0664 GW PERSONNEL: CWH / CW

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI-556 Meter, EGL WL Meter, GeoSub Pump

GENERAL						
WELL/LOCATION	EMW-23, EMW-23 REP					
WATER SOURCE	GROUNDWATER					
DATE	12/17/10					
TIME	918	920	922	924	926	0928

SAMPLING CONDITIONS	
SAMPLING METHOD GeoSub Submersible Pump – Low flow sampling	
DEPTH OF SAMPLE (BGS / TOC)	11.95
WELL DEPTH (BGS / TOC)	15.01
WATER LEVEL (BGS / TOC)	8.89
ONE WET CASING VOLUME	For 1 inch wells: (TD-WL)x0.04=____N/A___ gallons
For 2 inch wells: (TD-WL)x0.16=___N/A___ gallons	For 4 inch wells: (TD-WL)x0.65=____N/A___gallons

APPEARANCE	Light Brn. Light Turb					

FIELD MEASUREMENTS						
VOLUME REMOVED (~~GAL~~ L)	1	1.2	1.2	1.2	1.2	1.2
TOTAL VOLUME REMOVED (~~GAL~~ L)	1	2.2	3.4	4.6	5.8	7.0
TEMPERATURE (°C or °F)	10.33	11.23	11.59	11.96	11.94	12.02
CONDUCTIVITY (ATC, 25°C)	1.240	1.238	1.246	1.250	1.254 ✓	1.253
pH	6.68	6.83	7.06	7.10	7.19 ✓	7.14
REDOX (mV)	108.1	148.0	124.6	116.0	110.1	102.5
DISSOLVED OXYGEN (% / mg/L)	45.7 / 5.06	31.8 / 4.10	29.1 / 3.12	22.5 / 2.41	19.2 / 2.07	16.5 / 1.75
PURGE OR SAMPLE	P	P	P	P	S	

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
VOLATILE ORGANICS UF/~~UF~~ HCL	Yeah				6 -40 mL VOAs	0930
						1.2
						8.2
						12.09
						1.252
						7.10
						103.4
						14.6 / 1.55
LAB/DATE SUBMITTED				TA- 12/17/10	PACE- 12/17/10	

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SAMPLER'S INITIALS Cwl DATE 12/17/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ-Casper Orphan Site LOCATION: Casper, WY

PROJECT NO.: WQ-0664 GW PERSONNEL: CWH / CW

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI-556 Meter, EGL WL Meter, GeoSub Pump

GENERAL						
WELL/LOCATION	EMW-24					
WATER SOURCE	GROUNDWATER					
DATE	12/17/10					
TIME	1007	1011	1013	1015	1017	1019
SAMPLING CONDITIONS						
SAMPLING METHOD GeoSub Submersible Pump – Low Flow Sampling						
DEPTH OF SAMPLE (BGS / TOC) 11.97						
WELL DEPTH (BGS / TOC) 14.81						
WATER LEVEL (BGS / TOC) 9.17						
ONE WET CASING VOLUME For 1 inch wells: (TD-WL)x0.04= N/A gallons For 2 inch wells: (TD-WL)x0.16= N/A gallons For 4 inch wells: (TD-WL)x0.65= N/A gallons						
APPEARANCE	Clear					
FIELD MEASUREMENTS						
VOLUME REMOVED (~~GAL~~ L)	1	3.2	1.6	1.6	1.6	~~1.4~~ 1.6
TOTAL VOLUME REMOVED (~~GAL~~ L)	1	4.2	8			
TEMPERATURE (°C or °F)	10.95	11.99	12.22	12.16	12.30	12.27
CONDUCTIVITY (ATC, 25°C)	1.035	1.062	1.069	1.075	1.081 ✓	1.080
pH	7.50	7.45	7.42	7.41	7.34 ✓	7.44
REDOX (mV)	~~120~~ 64.6	30.6	15.2	3.3	1.6	-15.3
DISSOLVED OXYGEN (% / mg/L)	100.6 / 10.72	36.9 / 3.99	18.2 / 1.96	11.7 / 1.26	9.1 / 0.97	6.5 / 0.70
PURGE OR SAMPLE	P	P	P	P	S	
SAMPLES COLLECTED AND SAMPLE ANALYSIS						
VOLATILE ORGANICS UF/~~UP~~ HCL	MW HCL				3 -40 mL VOAs	1021 1.6
						12.26
						1.088
						7.43
						-15.0
						6.4/0.68
LAB/DATE SUBMITTED				TA- 12/17/10	PACE- N/A	

EnviroGroup Limited

SAMPLER'S INITIALS CWH DATE 12/17/10

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ / CASPER PCE ORPHAN PLUMES LOCATION: CASPER, WY

PROJECT NO. WQ-0664 PERSONNEL: C. WARREN

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) Geotech WL Meter #4190 Geosub SS pump # 2699 Geosub controller # 2913, YSI 556 # 1290, flowcell # 1232, DC to AC converter # 3219

GENERAL					
WELL/LOCATION	EMW-28				
WATER SOURCE	GROUNDWATER				
DATE	9/9/11 →				
TIME	1246	1250	1252	1254	1256

SAMPLING CONDITIONS					
SAMPLING METHOD	low flow sampling w/ submersible pump + tubing				
DEPTH OF SAMPLE (BGS / TOC)	9.71'				
WELL DEPTH (BGS / TOC)	14.28'				
WATER LEVEL (BGS / TOC)	5.13'				
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= NA gallons	CFP 1.4 L/purge		For 1 inch wells: (TD-WL)x0.04= NA gallons For 4 inch wells: (TD-WL)x0.65= NA gallons		
APPEARANCE	1. brown low turbidity	clear			

FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~ liters)	2L	2	2	2	2
TOTAL VOLUME REMOVED (~~GAL~~ liters)	2	4	6	8	10
TEMPERATURE (°C or °F)	22.05	21.68	21.14	20.85	20.81
CONDUCTIVITY (ATC, 25°C) mS/cm	0.658	0.636	0.608	0.606	0.601
pH	7.62	7.53	7.49	7.34	7.39
REDOX (mV)	306.1	289.5	236.7	190.7	182.7
OTHER D.O. % / mg/L	14.5/1.25	10.7/0.94	6.2/0.54	4.3/0.38	4.2/0.38
PURGE OR SAMPLE	P	P	P	P	P CAW

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
GROSS UF/UP					
DISSOLVED METALS F/HNO_3					
TOTAL METALS UF/HNO_3					
PETROLEUM HCs UF/HCl					
VOLATILE ORGANICS 8260B UF/UP (UF/HCl)					3-40mL vials on ice @ 4°C
SEMIVOLATILE ORGANICS UF/UP					
LAB/DATE SUBMITTED					TA 09/12/11

EnviroGroup Limited

SAMPLER'S INITIALS CAW DATE 9/9/11

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ / CASPER PCE ORPHAN PLUMES LOCATION: CASPER, WY

PROJECT NO. WR-0664 PERSONNEL: C. WARREN

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) Geotech WL Meter #490, Geosub SS pump # 2699, Geosub controller # 2943, YSI 556 # 1290, flowcell # 1232, DC to AC converter # 3219

GENERAL					
WELL/LOCATION	EMW-28 (cont'd)				
WATER SOURCE	GROUNDWATER				
DATE	9/9/11	→			
TIME	1259	1300			

SAMPLING CONDITIONS					
SAMPLING METHOD	low flow sampling w/ submersible pump + tubing				
DEPTH OF SAMPLE (BGS / TOC)					
WELL DEPTH (BGS / TOC)					
WATER LEVEL (BGS / TOC)					
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= NA gallons	CFP / L		For 1 inch wells: (TD-WL)x0.04= NA gallons For 4 inch wells: (TD-WL)x0.65= NA gallons		
APPEARANCE					

FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~ liters)	2	2			
TOTAL VOLUME REMOVED (~~GAL~~ liters)	12	14			
TEMPERATURE (°C or °F)	20.78	20.83			
CONDUCTIVITY (ATC, 25°C) mS/cm	0.600	0.597			
pH	7.36	7.35			
REDOX (mV)	174.3	172.1			
OTHER D.O. %/mg/L	4.1/0.40	4.2/0.39	/	/	/
PURGE OR SAMPLE	P	(CAN) P (S)	P	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
GROSS UF/UP					
DISSOLVED METALS F/HNO_3					
TOTAL METALS UF/HNO_3					
PETROLEUM HCs UF/HCl					
VOLATILE ORGANICS 8260B UF/UP (UF/HCl)					3 - 40 mL VOAs on Ice @ 4°C
SEMIVOLATILE ORGANICS UF/UP					
LAB/DATE SUBMITTED					TA 09/12/11

EnviroGroup Limited

SAMPLER'S INITIALS CAW DATE 9/9/11

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FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ / CASPER PCE ORPHAN PLUMES LOCATION: CASPER, WY

PROJECT NO. WA-0664 PERSONNEL: C. WARREN

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) Geotech WL Meter #490, Geosub SS pump #2699, Geosub controller # 2963, YSI 556 # 1290, flowcell # 1232, DC to AC converter # 3219

GENERAL					
WELL/LOCATION	EMW-29				
WATER SOURCE	GROUNDWATER				
DATE	9/9/11	→			
TIME	1021	1025	1027	1029	1032

SAMPLING CONDITIONS					
SAMPLING METHOD	low flow sampling w/ submersible pump + tubing				
DEPTH OF SAMPLE (BGS / TOC)	10.1'				
WELL DEPTH (BGS / TOC)	14.22'				
WATER LEVEL (BGS / TOC)	5.85'				
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= NA gallons	CFP 1.4 L		For 1 inch wells: (TD-WL)x0.04= NA gallons For 4 inch wells: (TD-WL)x0.65= NA gallons		
APPEARANCE	1. brown low turbidity	clear	→		

FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~ liters)	2	2	2	2	2
TOTAL VOLUME REMOVED (~~GAL~~ liters)	2	4	6	8	10
TEMPERATURE (°C or °F)	17.97	17.72	17.53	17.38	17.36
CONDUCTIVITY (ATC, 25°C) mS/cm	1.618	1.611	1.599	1.580	1.572
pH	7.57	7.31	7.20	7.01	7.13
REDOX (mV)	299.1	253.7	205.6	105.9	90.8
OTHER D.O. % / mg/L	5.3 / 0.50	4.1 / 0.38	3.6 / 0.34	3.3 / 0.31	3.5 / 0.33
PURGE OR SAMPLE	P	P	P	P	P

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS 8260B	UF/UP UF/HCl					~40 mL VOAs on Ice @ 4°C
SEMIVOLATILE ORGANICS	UF/UP					
LAB/DATE SUBMITTED						TA 09/12/11

EnviroGroup Limited

SAMPLER'S INITIALS CAW DATE 9/9/11

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ / CASPER PCE ORPHAN PLUMES LOCATION: CASPER, WY

PROJECT NO. WA-0664 PERSONNEL: C. WARREN

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) Geotech WL meter #490, Geosub SS pump #2699, Geosub controller #2963, YSI 556 #1290, flowcell #1232, DC to AC converter #3219

GENERAL					
WELL/LOCATION	EMW-29 (cont'd)				
WATER SOURCE	GROUNDWATER				
DATE	9/9/11	→			
TIME	1035	1037			
SAMPLING CONDITIONS					
SAMPLING METHOD	low flow sampling w/ submersible pump + tubing				
DEPTH OF SAMPLE (BGS / TOC)					
WELL DEPTH (BGS / TOC)					
WATER LEVEL (BGS / TOC)					
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= NA gallons	CFP 1.4 L		For 1 inch wells: (TD-WL)x0.04= NA gallons For 4 inch wells: (TD-WL)x0.65= NA gallons		
APPEARANCE	clear	clear			
FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~ liters)	2	2			
TOTAL VOLUME REMOVED (~~GAL~~ liters)	12	14			
TEMPERATURE (°C or °F)	17.42	17.41			
CONDUCTIVITY (ATC, 25°C) mS/cm	1.563	1.564			
pH	7.12	7.12			
REDOX (mV)	31.1	28.0			
OTHER DO. % / mg/L	3.6 / 0.34	3.6 / 0.34	/	/	/
PURGE OR SAMPLE	P	S (CAW)	P	P	S
SAMPLES COLLECTED AND SAMPLE ANALYSIS					
GROSS UF/UP					
DISSOLVED METALS F/HNO_3					
TOTAL METALS UF/HNO_3					
PETROLEUM HCs UF/HCl					
VOLATILE ORGANICS 8260B UF/UP (UF/HCl)					~40 mL VOAs on ice @ 4°C
SEMIVOLATILE ORGANICS UF/UP					
LAB/DATE SUBMITTED					TA 09/12/11

EnviroGroup Limited

SAMPLER'S INITIALS CAW DATE 9/9/11

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ / CASPER PCE ORPHAN PLUMES LOCATION: CASPER, WY

PROJECT NO. WA-0664 PERSONNEL: C. WARREN

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) Geotech WL Meter #490, Geosub SS pump #2699, Geosub controller #2963, YSI 556 #1290, flowcell #1232, DC to AC converter #3219

GENERAL					
WELL/LOCATION	EMW-30				
WATER SOURCE	GROUNDWATER				
DATE	9/9/11	→			
TIME	0919	0922	0924	0926	0929

SAMPLING CONDITIONS					
SAMPLING METHOD	low flow sampling w/ submersible pump + tubing				
DEPTH OF SAMPLE (BGS / TOC)	8.9'				
WELL DEPTH (BGS / TOC)	13.46'				
WATER LEVEL (BGS / TOC)	4.52'				
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= NA gallons	CFP 1.3L		For 1 inch wells: (TD-WL)x0.04= NA gallons For 4 inch wells: (TD-WL)x0.65= NA gallons		
APPEARANCE	mod turbidity l. brown	low turbidity l. brown	→	→	clear

FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~ liters)	2	2	2	2	2
TOTAL VOLUME REMOVED (~~GAL~~ liters)	2	4	6	8	10
TEMPERATURE (°C or °F)	15.95	15.27	15.23	15.35	14.99
CONDUCTIVITY (ATC, 25°C) mS/cm	3.201	3.218	3.269	3.247	3.236
pH	7.31	7.15	7.09	6.95	6.98
REDOX (mV)	227.2	204.3	158.4	120.3	107.4
OTHER D.O. % / mg/L	22.3/2.15	12.9 / 1.25	10.4/1.03	9.1 / 0.90	7.0 / 0.69
PURGE OR SAMPLE	P	P	P	P	P

SAMPLES COLLECTED AND SAMPLE ANALYSIS					
GROSS UF/UP					
DISSOLVED METALS F/HNO_3					
TOTAL METALS UF/HNO_3					
PETROLEUM HCs UF/HCl					
VOLATILE ORGANICS 8260B UF/UP (UF/HCl)					3 - 40 mL VOAs on Ice @ 4°C
SEMIVOLATILE ORGANICS UF/UP					
LAB/DATE SUBMITTED					TA 09/12/11

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SAMPLER'S INITIALS CAW DATE 9/9/11

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FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: WDEQ / CASPER PCE ORPHAN PLUMES LOCATION: CASPER, WY

PROJECT NO. WR-0664 PERSONNEL: C. WARREN

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) Geotech WL Meter #490, Geosub SS pump # 2699, Geosub controller # 2963, YSI 556 # 1290, flowcell # 1232, DC to AC converter # 3219

GENERAL					
WELL/LOCATION	EMW-30 (cont'd)				
WATER SOURCE	GROUNDWATER				
DATE	9/9/11	→	→	→	→
TIME	0931	0933	0936		

SAMPLING CONDITIONS					
SAMPLING METHOD	low flow sampling w/ submersible pump + tubing				
DEPTH OF SAMPLE (BGS / TOC)					
WELL DEPTH (BGS / TOC)					
WATER LEVEL (BGS / TOC)					
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= NA gallons	CFP 1.3 L		For 1 inch wells: (TD-WL)x0.04= NA gallons For 4 inch wells: (TD-WL)x0.65= NA gallons		
APPEARANCE	clear	clear	→		

FIELD MEASUREMENTS					
VOLUME REMOVED ~~(GAL)~~ liters	2	2	2		
TOTAL VOLUME REMOVED ~~(GAL)~~ liters	12	14	16		
TEMPERATURE (°C or °F)	14.98	15.06	15.07		
CONDUCTIVITY (ATC, 25°C) mS/cm	3.234	3.237	3.235		
pH	7.07	6.91	6.99		
REDOX (mV)	95.8	91.0	89.3		
OTHER D.O. % / mg/L	3.8 / 0.37	3.9 / 0.39	3.7 / 0.37	/	/
PURGE OR SAMPLE	P	P	S CAW	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS 8260B	UF/UP UF/HCl					3 - 40 mL VOAs on Ice @ 4°C
SEMIVOLATILE ORGANICS	UF/UP					
LAB/DATE SUBMITTED						TA 09/12/11

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SAMPLER'S INITIALS CAW DATE 9/9/11

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: Casper PCE Plume LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Camille Warren

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI, EGL WLI

GeoTech: GeoSub controller# 2963, GeoSub pump# 2769, Converter# 3219

GENERAL					
WELL/LOCATION	EMW-31 + EMW-31 DUP				
WATER SOURCE	Groundwater				
DATE	2/23/12	→			
TIME	0906	0908	0911	0913	0916

SAMPLING CONDITIONS					
SAMPLING METHOD	GeoSub - submersible pump - low flow sampling				
DEPTH OF SAMPLE (BGS / TOC)	10.5				
WELL DEPTH (BGS / TOC)	12.66'				
WATER LEVEL (BGS / TOC)	9.59'				
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= NA gallons	LFD 1.4 L / purge		For 1 inch wells: (TD-WL)x0.04= NA gallons For 4 inch wells: (TD-WL)x0.65= NA gallons		
APPEARANCE	brown, med turbidity	l. brown, low turbidity	→		

FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~ L)	2	2	2	2	2
TOTAL VOLUME REMOVED (~~GAL~~ L)	2	4	6	8	10
TEMPERATURE (°C or °F)	15.05	15.38	15.46	15.62	15.59
CONDUCTIVITY (ATC, 25°C) mS/cm	1.121	1.103	1.094	1.083	1.071
pH	7.52	7.41	7.33	7.27	7.26
REDOX (mV)	289.6	241.3	213.8	196.4	188.1
Dissolved Oxygen ~~OTHER~~ (%/mg/L)	13.6 / 1.32	9.6 / 0.94	5.4 / 0.51	3.9 / 0.38	3.1 / 0.29
PURGE OR SAMPLE	P	P	P	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					—
DISSOLVED METALS	F/HNO_3					—
TOTAL METALS	UF/HNO_3					—
PETROLEUM HCs	UF/HCl					—
VOLATILE ORGANICS 8260B	UF/UP UF/HCl					6 x 40mL
SEMIVOLATILE ORGANICS	UF/UP					—
LAB/DATE SUBMITTED						T.A.

EnviroGroup Limited

SAMPLER'S INITIALS CAW DATE 02/23/12

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: Casper PCE Plume LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Camille Warren

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL YSI, EGL WLT

GeoTech: GeoSub controller #2963, GeoSub pump #2769, converter #3219

GENERAL					
WELL/LOCATION	EMW-32				
WATER SOURCE	Groundwater				
DATE	02/23/12	→			
TIME	0823	0825	0827	0830	0832 ~~0837~~ CAW 02/23/12

SAMPLING CONDITIONS					
SAMPLING METHOD	"GeoSub" - submersible pump - low flow sampling				
DEPTH OF SAMPLE (BGS / TOC)	~11'				
WELL DEPTH (BGS / TOC)	12.67'				
WATER LEVEL (BGS / TOC)	8.48'				
ONE WET CASING VOLUME	LFD		For 1 inch wells: (TD-WL)x0.04= NA gallons		
For 2 inch wells: (TD-WL)x0.16= NA gallons	1.4 L/purge		For 4 inch wells: (TD-WL)x0.65= NA gallons		
APPEARANCE	brown, med turbidity	1. brown, low turbidity	→	→	clear

FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~ L)	2	2	2	2	2
TOTAL VOLUME REMOVED (~~GAL~~ L)	2	4	6	8	10
TEMPERATURE (°C or °F)	14.96	14.71	14.55	14.36	14.34
CONDUCTIVITY (ATC, 25°C) (µS/cm)	1.628	1.621	1.618	1.609	1.593
pH	7.47	7.33	7.24	CW 2/23/12 ~~7.09~~ 7.19	7.11
REDOX (mV)	279.6	252.8	214.3	196.7	162.9
Dissolved Oxygen ~~OTHER~~ (%/mg/L)	7.2 / 0.69	6.1 / 0.58	4.4 / 0.41	3.1 / 0.32	2.9 / 0.27
PURGE OR SAMPLE	P	P	P	P	P

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS 8260B	UF/UP UF/HCl					3 x 40mL VOAs
SEMIVOLATILE ORGANICS	UF/UP					(ON ICE 4°C)
LAB/DATE SUBMITTED						T.A. 02/24/12

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SAMPLER'S INITIALS CAW DATE 02/23/12

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: Casper PCE Plume LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Camille Warren

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL 45I, EGL WLI, GeoTech: GeoSub controller # 2963, GeoSub pump # 2769, Converter # 3219

GENERAL					
WELL/LOCATION	EMW-32 (cont'd)				
WATER SOURCE	Groundwater				
DATE	02/23/12	→			
TIME	0835	0837			

SAMPLING CONDITIONS					
SAMPLING METHOD	low flow sampling - submersible pump				
DEPTH OF SAMPLE (BGS / TOC)					
WELL DEPTH (BGS / TOC)					
WATER LEVEL (BGS / TOC)					
ONE WET CASING VOLUME For 2 inch wells: (TD-WL)x0.16= NA gallons	LFP 1.4 L/purge		For 1 inch wells: (TD-WL)x0.04= NA gallons For 4 inch wells: (TD-WL)x0.65= NA gallons		
APPEARANCE	clear	clear			

FIELD MEASUREMENTS					
VOLUME REMOVED (GAL)	2	2			
TOTAL VOLUME REMOVED (GAL)	12	14			
TEMPERATURE (°C or °F)	14.32	14.31			
CONDUCTIVITY (ATC, 25°C) (mS/cm)	1.591	1.587			
pH	7.09	7.03			
REDOX (mV)	151.7	140.2			
~~OTHER~~ Dissolved Oxygen (%/mg/L)	2.7 / 0.26	2.6 / 0.25			
PURGE OR SAMPLE	P	S			

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS 8260B	UF/UP UF/HCl					3 x 40mL VOAs (ON ICE 4°C)
SEMIVOLATILE ORGANICS	UF/UP					
LAB/DATE SUBMITTED						T.A. 02/24/12

EnviroGroup Limited

SAMPLER'S INITIALS CAW DATE 02/23/12

FIELD WATER QUALITY SAMPLING AND ANALYSIS

PROJECT: Casper PCE Plume LOCATION: Casper, WY

PROJECT NO. WQ-0664 PERSONNEL: Camille Warren

INSTRUMENTS: (Conductivity, Temperature, pH, Redox, etc.) EGL 4SI, EGL WLI, Geotech: GeoSub Controller# 2963, Geosub pump# 2769, converter# 3219

GENERAL					
WELL/LOCATION	EMW-33				
WATER SOURCE	Groundwater				
DATE	2/23/12	→			→
TIME	0749	0751	0754	0756	0759

SAMPLING CONDITIONS					
SAMPLING METHOD	Geosub - submersible pump - low flow sampling				
DEPTH OF SAMPLE (BGS / TOC)	~11'				
WELL DEPTH (BGS / TOC)	12.29'				
WATER LEVEL (BGS / TOC)	9.73'				
ONE WET CASING VOLUME	LFP		For 1 inch wells: (TD-WL)x0.04= NA gallons		
For 2 inch wells: (TD-WL)x0.16= NA gallons	1.4 L/purge		For 4 inch wells: (TD-WL)x0.65= NA gallons		
APPEARANCE	1. brown, med turbidity	→	1 brown, low turbidity	→	clear

FIELD MEASUREMENTS					
VOLUME REMOVED (~~GAL~~ L)	2	2	2	2	2
TOTAL VOLUME REMOVED (~~GAL~~ L)	2	4	6	8	10
TEMPERATURE (°C or °F)	13.95	13.27	13.32	13.35	13.29
CONDUCTIVITY (ATC, 25°C) (mS/cm)	3.124	3.186	3.169	3.204	3.225
pH	7.41	7.20	7.13	7.01	6.97
REDOX (mV)	201.3	211.4	169.3	132.9	119.6
~~OTHER~~ Dissolved Oxygen (%/mg/L)	20.4 / 2.01	13.1 / 1.27	9.2 / 0.89	7.7 / 0.75	7.1 / 0.69
PURGE OR SAMPLE	P	P	P	P	S

SAMPLES COLLECTED AND SAMPLE ANALYSIS						
GROSS	UF/UP					
DISSOLVED METALS	F/HNO_3					
TOTAL METALS	UF/HNO_3					
PETROLEUM HCs	UF/HCl					
VOLATILE ORGANICS 8260B	UF/UP UF/HCl					3x40mL VOAs (ON ICE 4°C)
SEMIVOLATILE ORGANICS	UF/UP					
LAB/DATE SUBMITTED						T.A. 02/24/12

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SAMPLER'S INITIALS CAW DATE 02/23/12

T:\EGL STD Forms\Field Forms\GW_SW Sampling\Field Water Quality Sampling