

Estimate of Constituent concentrations of Pump test water after dilution into a specified volume of Laramie formation water

Inputs	units	Value
Base of Laramie	ft	434
Top of Water table	ft	100
Porosity of Laramie	-	0.15
Pump test Vol	gal	172,800
Laramie dilution water	gal	5,000,000

Computed parameters	units	value
Thickness of Sat'd zone	ft	334
Surface area of affected water in Laramie*	acre	0.32
Dilution factor		29.9:1
* Assumes pump test water is uniformly diluted through saturated thickness of Laramie		

Well ID		IS-003T	IS-003Ta	Computed by
Formation		A2	Laramie	mixing model
Collection date		8/12/2008	8/21/2008	
Constituent	units			
Bicarbonate	mg/L	278	411	407
Calcium	mg/L	87	226	221
Chloride	mg/L	9	9	9
Flouride	mg/L	0.5	0.5	0.5
Magnesium	mg/L	29	66	65
Potassium	mg/L	7	15	15
Silica	mg/L	6.8	5.2	5.3
Sodium	mg/L	29	88	86
Sulfate	mg/L	107	479	467
TDS (180 C)	mg/L	405	1080	1,057
Uranium (total)	mg/L	0.259	0.0112	0.019
Radium-226	pCi/L	15	4.7	5.0



LABORATORY ANALYTICAL REPORT

Client: Powertech (USA) Inc
Project: Centennial R2-00150
Lab ID: C08061324-001
Client Sample ID: IS-003T (A2 Sand - Pump Well)

Report Date: 08/12/08
Collection Date: 06/25/08 10:43
Date Received: 06/27/08
Matrix: Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO3	228	mg/L		1		A2320 B	07/01/08 11:58 / ljl
Carbonate as CO3	ND	mg/L		1		A2320 B	07/01/08 11:58 / ljl
Bicarbonate as HCO3	278	mg/L		1		A2320 B	07/01/08 11:58 / ljl
Hydroxide as OH	ND	mg/L		1		A2320 B	07/01/08 11:58 / ljl
Calcium	87	mg/L		1		E200.7	07/16/08 13:30 / cp
Chloride	9	mg/L		1		A4500-Cl B	07/09/08 13:16 / ljl
Fluoride	0.5	mg/L		0.1		A4500-F C	06/30/08 14:58 / ljl
Magnesium	29	mg/L		1		E200.7	07/16/08 13:30 / cp
Phosphorus, Ortho as P, Dissolved	ND	mg/L		0.01		E365.1	07/08/08 10:20 / eli-h
Phosphorus, Total as P	0.01	mg/L		0.01		E365.1	07/03/08 10:55 / eli-h
Potassium	7	mg/L		1		E200.7	07/16/08 13:30 / cp
Silica	6.8	mg/L		0.1		E200.7	07/11/08 14:05 / cp
Sodium	29	mg/L		1		E200.7	07/11/08 14:05 / cp
Sulfate	107	mg/L		5		A4500-SO4 E	07/02/08 10:01 / sp
MAJOR IONS - DISSOLVED							
Nitrogen, Nitrate as N	ND	mg/L		0.1		E353.2	07/01/08 11:12 / sw
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	06/30/08 13:25 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO2 B	06/27/08 16:58 / jal
NON-METALS							
Organic Carbon, Total (TOC)	1.1	mg/L		0.5		A5310 C	07/09/08 21:31 / jp
Sulfide	ND	mg/L		1		A4500-S F	07/01/08 15:16 / sp
PHYSICAL PROPERTIES							
Hardness as CaCO3	336	mg/L		1		A2340 B	07/16/08 13:30 / sw
Solids, Total Dissolved TDS @ 180 C	405	mg/L		10		A2540 C	06/28/08 10:49 / dd
Solids, Total Suspended TSS @ 105 C	19	mg/L		10		A2540 D	06/30/08 11:44 / jh
Calcium, SAR	4.36	meq/L		0.05		E200.7	07/16/08 13:30 / cp
Magnesium, SAR	2.38	meq/L		0.08		E200.7	07/16/08 13:30 / cp
Sodium, SAR	1	meq/L		1		E200.7	07/16/08 13:30 / cp
Sodium Adsorption Ratio (SAR)	0.7	unitless		0.1		Calculation	07/16/08 13:30 / sw
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.7	07/11/08 14:05 / cp
Antimony	0.001	mg/L		0.001		E200.8	07/21/08 22:40 / sml
Arsenic	ND	mg/L		0.001		E200.8	07/21/08 22:40 / sml
Barium	ND	mg/L		0.1		E200.7	07/11/08 14:05 / cp
Beryllium	ND	mg/L		0.001		E200.7	07/11/08 14:05 / cp
Boron	0.1	mg/L		0.1		E200.7	07/11/08 14:05 / cp
Cadmium	ND	mg/L		0.001		E200.8	07/21/08 22:40 / sml

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.



LABORATORY ANALYTICAL REPORT

Client: Powertech (USA) Inc
 Project: Centennial R2-00150
 Lab ID: C08061324-001
 Client Sample ID: IS-003T

Report Date: 08/12/08
 Collection Date: 06/25/08 10:43
 Date Received: 06/27/08
 Matrix: Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
METALS - DISSOLVED							
Chromium	ND	mg/L		0.01		E200.7	07/11/08 14:05 / cp
Cobalt	ND	mg/L		0.01		E200.7	07/11/08 14:05 / cp
Copper	ND	mg/L		0.01		E200.7	07/11/08 14:05 / cp
Iron	ND	mg/L		0.03		E200.7	07/11/08 14:05 / cp
Lead	ND	mg/L		0.01		E200.8	07/21/08 22:40 / sml
Manganese	0.11	mg/L		0.01		E200.7	07/11/08 14:05 / cp
Mercury	ND	mg/L		0.0002		E200.8	07/23/08 14:08 / sml
Molybdenum	ND	mg/L		0.01		E200.7	07/11/08 14:05 / cp
Nickel	ND	mg/L		0.01		E200.7	07/11/08 14:05 / cp
Selenium	ND	mg/L		0.001		E200.8	07/21/08 22:40 / sml
Silver	ND	mg/L		0.05		E200.7	07/11/08 14:05 / cp
Strontium	1.5	mg/L		0.1		E200.7	07/11/08 14:05 / cp
Thallium	ND	mg/L		0.001		E200.8	07/21/08 22:40 / sml
Uranium	0.222	mg/L		0.0003		E200.8	07/21/08 22:40 / sml
Vanadium	ND	mg/L		0.1		E200.7	07/11/08 14:05 / cp
Zinc	ND	mg/L		0.01		E200.7	07/11/08 14:05 / cp
METALS - TOTAL							
Aluminum	0.7	mg/L		0.1		E200.7	07/08/08 02:05 / cp
Antimony	0.066	mg/L	D	0.002		E200.8	07/17/08 00:04 / ts
Arsenic	ND	mg/L		0.001		E200.8	07/17/08 00:04 / ts
Barium	ND	mg/L		0.1		E200.7	07/08/08 02:05 / cp
Beryllium	ND	mg/L		0.001		E200.8	07/21/08 16:05 / ts
Boron	0.1	mg/L		0.1		E200.7	07/08/08 02:05 / cp
Cadmium	ND	mg/L		0.001		E200.8	07/17/08 00:04 / ts
Calcium	96	mg/L		1		E200.7	07/08/08 02:05 / cp
Chromium	ND	mg/L		0.01		E200.7	07/08/08 02:05 / cp
Cobalt	ND	mg/L		0.01		E200.7	07/08/08 02:05 / cp
Copper	0.02	mg/L		0.01		E200.7	07/08/08 02:05 / cp
Iron	13.1	mg/L		0.03		E200.7	07/08/08 02:05 / cp
Lead	ND	mg/L		0.01		E200.7	07/08/08 02:05 / cp
Magnesium	26	mg/L		1		E200.7	07/08/08 02:05 / cp
Manganese	0.22	mg/L		0.01		E200.7	07/08/08 02:05 / cp
Mercury	ND	mg/L		0.0002		E245.1	07/07/08 21:09 / eli-b
Molybdenum	ND	mg/L		0.01		E200.7	07/08/08 02:05 / cp
Nickel	ND	mg/L		0.01		E200.7	07/08/08 02:05 / cp
Potassium	7	mg/L		1		E200.7	07/08/08 02:05 / cp
Selenium	0.002	mg/L	D	0.002		E200.8	07/17/08 00:04 / ts
Silica	9.3	mg/L		0.1		E200.7	07/08/08 02:05 / cp
Silver	ND	mg/L		0.05		E200.7	07/08/08 02:05 / cp
Sodium	30	mg/L		1		E200.7	07/08/08 02:05 / cp
Strontium	1.5	mg/L		0.1		E200.7	07/08/08 02:05 / cp

Report Definitions:
 RL - Analyte reporting limit.
 QCL - Quality control limit.
 MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.
 D - RL increased due to sample matrix interference.



LABORATORY ANALYTICAL REPORT

Client: Powertech (USA) Inc
 Project: Centennial R2-00150
 Lab ID: C08061324-001
 Client Sample ID: IS-003T

Report Date: 08/12/08
 Collection Date: 06/25/08 10:43
 Date Received: 06/27/08
 Matrix: Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Thallium	ND	mg/L		0.001		E200.8	07/17/08 00:04 / ts
Uranium	0.250	mg/L		0.0003		E200.8	07/18/08 17:24 / ts
Vanadium	ND	mg/L		0.1		E200.7	07/08/08 02:05 / cp
Zinc	0.03	mg/L		0.01		E200.7	07/08/08 02:05 / cp
RADIONUCLIDES - DISSOLVED							
Gross Alpha	786	pCi/L				E900.0	08/05/08 09:25 / crw
Gross Alpha precision (±)	15.6	pCi/L				E900.0	08/05/08 09:25 / crw
Gross Alpha MDC	2.9	pCi/L				E900.0	08/05/08 09:25 / crw
Gross Beta	149	pCi/L				E900.0	08/05/08 09:25 / crw
Gross Beta precision (±)	3.5	pCi/L				E900.0	08/05/08 09:25 / crw
Gross Beta MDC	2.8	pCi/L				E900.0	08/05/08 09:25 / crw
Radium 226	15.0	pCi/L				E903.0	07/21/08 18:07 / trs
Radium 226 precision (±)	0.7	pCi/L				E903.0	07/21/08 18:07 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	07/21/08 18:07 / trs
RADIONUCLIDES - TOTAL							
Radon 222	88500	pCi/L		100		D5072-92	06/30/08 17:19 / dpb
Radon 222 precision (±)	473	pCi/L				D5072-92	06/30/08 17:19 / dpb
DATA QUALITY							
A/C Balance (± 5)	7.35	%				Calculation	08/12/08 10:12 / sw
Anions	7.05	meq/L				Calculation	08/12/08 10:12 / sw
Cations	8.17	meq/L				Calculation	08/12/08 10:12 / sw
Solids, Total Dissolved Calculated	417	mg/L				Calculation	08/12/08 10:12 / sw
TDS Balance (0.80 - 1.20)	0.970					Calculation	08/12/08 10:12 / sw
- The Anion / Cation balance was confirmed by re-analysis.							
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		0.50		SW8021B	07/04/08 16:59 / dkh
Ethylbenzene	ND	ug/L		0.50		SW8021B	07/04/08 16:59 / dkh
m+p-Xylenes	ND	ug/L		0.50		SW8021B	07/04/08 16:59 / dkh
o-Xylene	ND	ug/L		0.50		SW8021B	07/04/08 16:59 / dkh
Toluene	15	ug/L		0.50		SW8021B	07/04/08 16:59 / dkh
Surr: Trifluorotoluene	96.0	%REC		80-120		SW8021B	07/04/08 16:59 / dkh

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