OGMCOAL

From: "Leonard, JD" <jleonard@coalsource.com>
To: <ogmcoal@utah.gov>
Date: 9/28/2012 12:36 PM
Attachments: Ken Hoffman Crandall Final Document.xlsx

From: Leonard, JD
Sent: Friday, September 28, 2012 12:34 PM
To: 'Ken Hoffman'
Subject:

Hi Ken,

Attached is the August monthly information for Crandall Canyon Mine, if you have any questions or need additional information please contact me.

Thank You
JD Leonard
435-888-4026
jleonard@coalsource.com

Crandall Canyon Mine
Post-Treatment Mine Water 2012

Parameter	Units	January	February	March	April	May	June	July	August	September	October	November	December
		1/24/2012	2/21/2012	3/23/2012	4/17/2012	5/15/2012	6/12/2012	7/30/2012	8/31/2012				
Field													
pH	std. units	7.6	8.1	8.5	7.8	7.5	7.5	8.1	8.2				
Temperature	deg. C	9 C	9 C	12 C	11 C	13 C	13 C	12 C	11 C				
Conductivity	µmhos/cm2	926	733	1066	1085	1270	933	913	984				
Dissolved Oxygen	mg/L	9.09	8.9	8.2	8.9	9.2	8.14	11.28	11.53				
Lab													
Iron	total, mg/L	0.08	0.05	0.068	<0.05	0.09	<0.05	<0.05	<0.05				
Iron	dissolved, mg/L	<0.03	<0.03	0.067	<0.03	<.03	<0.03	<0.03	<0.03				
Iron	ferrous, mg/L	0.052	0	0.06	0.02	0.019	0	0.03	0.005				
Aluminum	total, mg/L	0.1	0.09	0.14	0.08	0.16	0.09	0.1	0.13				
Aluminum	dissolved, mg/L	<0.03	<0.03	<0.03	<0.03	<.03	<0.03	<0.03	<0.03				
Manganese	total, mg/L	0.093	0.068	0.068	0.075	0.089	0.085	0.083	0.08				
Manganese	dissolved, mg/L	0.093	0.068	0.067	0.075	0.089	0.085	0.083	0.08				
Alkalinity	Bicarbonate, mg/L	357	273	275	300	367	359	368	364				
Alkalinity	Carbonate, mg/L	<5	<5	<5	<5	<5	<5	<5	<5				
Alkalinity	Total	357	273	275	300	367	359	368	364				
Sulfate	mg/L	147	110	109	120	148	150	142	138				
TDS	mg/L	590	446	436	477	595	575	572	556				
Suspended Solids	mg/L	<5	<5	<5	<5	<5	<5	14	9				
Seep Flow	gpm	3.01	1	1	1.5	1.5	1.5	1.5	2				

Pre-Treatment Mine Water 2012

Parameter	Units	January	February	March	April	May	June	July	August	September	October	November	December
Field													
pH	std. units	7.3	7.5	7.3	7.4	7.3	7.3	7	7.2				
Temperature	deg. C	11 C	11 C	11 C	11 C	12 C	10 C	11C	11 C				
Conductivity	µmhos/cm2	919	723	1290	1254	1290	982	921	1010				
Dissolved Oxygen	mg/L	7.1	7.8	7.4	7.5	7.6	7.5	7.08	6.83				
Lab													
Iron	total, mg/L	2.290	1.580	2.960	2.450	2.730	4.020	2.990	2.720				
Iron	dissolved, mg/L	0.03	0.06	<0.03	0.17	<0.03	<0.03	<0.03	0.05				
Iron	ferrous, mg/L	0.96	0.469	1.236	0.754	0.809	0.901	0.803	0.674				
Aluminum	total, mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				
Aluminum	dissolved, mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				
Manganese	total, mg/L	0.097	0.071	0.105	0.094	0.097	0.098	0.099	0.102				
Manganese	dissolved, mg/L	0.097	0.071	0.105	0.094	0.097	0.093	0.088	0.093				
Alkalinity	Bicarbonate, mg/L	375	282	359	371	378	371	375	370				
Alkalinity	Carbonate, mg/L	<5	<5	<5	<5	<5	<5	<5	<5				
Alkalinity	Total	375	282	359	371	378	371	375	370				
Sulfate	mg/L	148	108	148	145	151	151	144	141				
TDS	mg/L	603	448	591	576	596	581	576	565				
Suspended Solids	mg/L	<5	<5	<5	<5	<5	<5	23	5				
Chloride	mg/L	9	7	9	9	9	9	9	9				
Calcium	Dissolved, mg/L	98.75	72.01	100.65	99.14	99.6	98.47	93.58	97.21				
Potassium	Dissolved, mg/L	8.25	5.99	8.24	8.12	8.09	7.9	8.14	8.22				
Sodium	Dissolved, mg/L	33.68	24.69	33.74	32.94	32.75	31.9	32.29	34.4				
Magnesium	Dissolved, mg/L	53.18	38.57	54.42	54.95	55.73	54.4	50.85	53.56				
Silica	Dissolved, mg/L	8.51	5.92	7.98	8.84	8.26	7.94	9.18	9.25				
Hot Acidity	mg/L	-374	<5	-376	-370	-376	-368	-374	<5				
Average Flow	gpm	429	430	395	389	412	399	393	400				

Crandall Canyon Mine Flows				
Date	Time	Pressure	GPM	Recorded by:
1/1/2012	10:00	30.59	381	Brenda
1/2/2012	10:00	30.63	338	Brenda
1/3/2011	10:00	30.47	381	Brenda
1/4/2011	10:00	30.60	348	Brenda
1/5/2012	10:00	30.39	387	Rachel
1/6/2012	10:00	30.16	460	Rachel
1/7/2012	10:00	29.95	538	Rachel
1/8/2012	10:00	30.19	486	Rachel
1/9/2012	10:00	30.33	418	Brenda
1/10/2012	10:00	30.22	426	Brenda
1/11/2012	10:00	30.16	466	Brenda
1/12/2012	10:00	30.26	436	Brenda
1/13/2012	10:00	30.30	430	Rachel
1/14/2012	10:00	30.37	404	Rachel
1/15/2012	10:00	30.05	428	Rachel
1/16/2012	10:00	29.72	581	Rachel
1/17/2012	10:00	30.24	478	Brenda
1/18/2012	10:00	30.13	462	Brenda
1/19/2012	10:00	30.03	449	Brenda
1/20/2012	10:00	30.02	461	Brenda
1/21/2012	10:00	29.71	471	Rachel
1/22/2012	10:00	29.98	540	Rachel
1/23/2012	10:00	29.97	466	Rachel
1/24/2012	10:00	30.12	443	Rachel
1/25/2012	10:00	30.39	367	Brenda
1/26/2011	10:00	30.22	380	Brenda
1/27/2012	10:00	30.24	384	Brenda
1/28/2012	10:00	30.44	363	Brenda
1/29/2012	10:00	30.43	336	Rachel
1/30/2012	10:00	30.11	390	Rachel
1/31/2012	10:00	30.11	416	Rachel
		Monthly Average		429.41

Crandall Canyon Mine Flows				
Date	Time	Pressure	GPM	Recorded by:
2/1/2012	10:00	30.22	397	Rachel
2/2/2012	10:00	29.96	438	Brenda
2/3/2012	10:00	30.15	432	Brenda
2/4/2012	10:00	30.28	394	Brenda
2/5/2012	10:00	30.25	384	Brenda
2/6/2012	10:00	30.11	418	Rachel
2/7/2012	10:00	30.24	408	Rachel
2/8/2012	10:00	30.26	398	Rachel
2/9/2012	10:00	30.28	388	Rachel
2/10/2012	10:00	30.24	390	Brenda
2/11/2012	10:00	30.10	416	Brenda
2/12/2012	10:00	29.76	604	Brenda
2/13/2012	10:00	29.82	488	Brenda
2/14/2012	10:00	29.77	513	Rachel
2/15/2012	10:00	29.93	469	Rachel
2/16/2012	10:00	30.20	411	Rachel
2/17/2012	10:00	30.20	398	Rachel
2/18/2012	10:00	30.09	401	Brenda
2/19/2012	10:00	29.72	478	Brenda
2/20/2012	10:00	30.03	456	Brenda
2/21/2012	10:00	30.10	416	Brenda
2/22/2012	10:00	30.05	394	Rachel
2/23/2012	10:00	30.02	436	Rachel
2/24/2012	10:00	30.30	392	Rachel
2/25/2012	10:00	30.00	397	Brenda
2/26/2012	10:00	30.13	419	Rachel
2/27/2012	10:00	29.92	422	Brenda
2/28/2012	10:00	29.70	499	Brenda
2/29/2012	10:00	30.03	430	Brenda
Monthly Average				430.55
Crandall Canyon Mine Flows				
Date	Time	Pressure	GPM	Recorded by;

3/1/2012	10:00	29.82	443	Rachel
3/2/2012	10:00	30.04	434	Rachel
3/3/2012	10:00	30.33	368	Rachel
3/4/2012	10:00	30.37	328	Rachel
3/5/2012	10:00	30.24	338	Brenda
3/6/2012	10:00	29.71	431	Brenda
3/7/2012	10:00	29.65	551	Brenda
3/8/2012	10:00	30.36	377	Brenda
3/9/2019	10:00	30.43	315	Rachel
3/10/2012	10:00	30.11	342	Rachel
3/11/2012	10:00	29.88	403	Brenda
3/12/2012	10:00	30.00	410	Brenda
3/13/2012	10:00	29.98	399	Brenda
3/14/2012	10:00	30.05	404	Brenda
3/15/2012	10:00	30.17	370	Leland
3/16/2012	10:00	29.96	398	Leland
3/17/2012	10:00	29.57	496	Leland
3/18/2012	10:00	29.63	514	Rachel
3/19/2012	10:00	30.06	434	Rachel
3/20/2012	10:00	30.14	374	Rachel
3/21/2012	10:00	30.08	353	Rachel
3/22/2012	10:00	30.06	366	Brenda
3/23/2012	10:00	30.11	363	Brenda
3/24/2012	10:00	30.01	357	Brenda
3/25/2012	10:00	29.73	430	Brenda
3/26/2012	10:00	30.00	383	Leland
3/27/2012	10:00	29.90	386	Leland
3/28/2012	10:00	30.06	376	Leland
3/29/2012	10:00	30.06	380	Leland
3/30/2012	10:00	29.97	320	Rachel
Monthly Average				**395gpm**

Crandall Canyon Mine Flows

Date	Time	Pressure	GPM	Recorded by;
4/1/2012	10:00	29.64	442	Rachel

4/2/2012	10:00	29.92	427	Rachel
4/3/2012	10:00	30.06	396	Rachel
4/4/2012	10:00	29.97	393	Brenda
4/5/2012	10:00	29.85	415	Brenda
4/6/2012	10:00	29.88	452	Brenda
4/7/2012	10:00	30.39	357	Brenda
4/8/2012	10:00	30.35	326	Leland
4/9/2012	10:00	30.2	330	Leland
4/10/2012	10:00	30.09	356	Brenda
4/11/2012	10:00	29.91	385	Brenda
4/12/2012	10:00	29.89	433	Rachel
4/13/2012	10:00	29.9	487	Rachel
4/14/2012	10:00	29.58	499	Brenda
4/15/2012	10:00	29.95	453	Brenda
4/16/2012	10:00	30.21	389	Brenda
4/17/2012	10:00	30.15	353	Brenda
4/18/2012	10:00	30.08	338	Rachel
4/19/2012	10:00	30.09	371	Rachel
4/20/2012	10:00	30.26	345	Rachel
4/21/2012	10:00	30.25	334	Rachel
4/22/2012	10:00	30.24	335	Brenda
4/23/2012	10:00	30.2	345	Brenda
4/24/2012	10:00	30.08	364	Brenda
4/25/2012	10:00	30.06	385	Brenda
4/26/2012	10:00	29.93	399	Rachel
4/27/2012	10:00	30.04	374	Rachel
4/28/2012	10:00	30.1	410	Rachel
4/29/2012	10:00	30.07	411	Rachel
4/30/2012	10:00	30.07	395	Brenda
Monthly Average				**389gpm**

Crandall Canyon Mine Flows

Date	Time	Pressure	GPM	Recorded by;
5/1/2012	10:00	29.87	445	Brenda
5/2/2012	10:00	29.88	450	Brenda

5/3/2012	10:00	29.96	424	Brenda
5/4/2012	10:00	30.01	418	Rachel
5/5/2012	10:00	30.08	366	Rachel
5/6/2012	10:00	30.16	384	Rachel
5/7/2012	10:00	30.08	387	Rachel
5/8/2012	10:00	30.22	376	Rachel
5/9/2012	10:00	30.17	371	Rachel
5/10/2012	10:00	30.08	410	Lily
5/11/2012	10:00	29.78	534	Lily
5/12/2012	10:00	30.22	359	Rachel
5/13/2012	10:00	30.27	363	Rachel
5/14/2012	10:00	30.32	350	Rachel
5/15/2012	10:00	30.22	363	Rachel
5/16/2012	10:00	30.11	391	Brenda
5/17/2012	10:00	30.03	415	Brenda
5/18/2012	10:00	29.68	503	Brenda
5/19/2012	10:00	30.08	448	Brenda
5/20/2012	10:00	30.23	402	Rachel
5/21/2012	10:00	30.25	380	Rachel
5/22/2012	10:00	29.98	406	Rachel
5/23/2012	10:00	29.81	474	Rachel
5/24/2012	10:00	29.86	486	Brenda
5/25/2012	10:00	29.54	553	Brenda
5/26/2012	10:00	29.61	561	Brenda
5/27/2012	10:00	29.98	461	Brenda
5/28/2012	10:00	30.17	411	Rachel
5/29/2012	10:00	30.14	395	Rachel
5/30/2012	10:00	30.14	390	Rachel
5/31/2012	10:00	30.18	379	Rachel
Monthly Average				**412gpm**

Crandall Canyon Mine Flows

Date	Time	Pressure	GPM	Recorded by;
6/1/2012	10:00	30.12	384	Brenda
6/2/2012	10:00	29.99	409	Brenda

6/3/2012	10:00	30.06	411	Brenda
6/4/2012	10:00	30.05	401	Brenda
6/6/2012	10:00	30.06	437	Rachel
6/7/2012	10:00	30.08	414	Rachel
6/8/2012	10:00	30	406	Rachel
6/9/2012	10:00	30.09	458	Brenda
6/10/2001	10:00	30.14	427	Brenda
6/11/2012	10:00	30.09	387	Brenda
6/12/2012	10:00	30.2	370	Brenda
6/13/2012	10:00	30.01	388	Rachel
6/14/2012	10:00	29.98	413	Lily
6/15/2012	10:00	29.97	412	Rachel
6/16/2012	10:00	29.97	390	Rachel
6/17/2012	10:00	29.98	881	Brenda
6/18/2012	10:00	29.94	416	Brenda
6/19/2012	10:00	29.91	445	Brenda
6/20/2012	10:00	29.91	420	Brenda
6/21/2012	10:00	30.17	486	Rachel
6/22/2012	10:00	30	403	Rachel
6/23/2012	10:00	29.98	443	Lily
6/24/2012	10:00	30.03	402	Rachel
6/25/2012	10:00	39.41	390	Lily
6/26/2012	10:00	39.41	400	Lily
6/27/2012	10:00	39.41	403	Lily
6/28/2012	10:00	30.23	414	Rachel
6/29/2012	10:00	30.22	372	Rachel
6/30/2012	10:00	30.12	381	Rachel
Monthly Average				399gpm

Crandall Canyon Mine Flows

Date	Time	Pressure	GPM	Recorded by;
7/1/2012	10:00	30.03	397	Rachel
7/2/2012	10:00	30.11	401	Rachel
7/3/2012	10:00	30.08	397	Rachel
7/4/2012	10:00	39.62	403	Lily

7/5/2012	10:00	XX	XX	Lily
7/6/2012	10:00	30.24	389	Rachel
7/7/2012	10:00	30.26	370	Rachel
7/8/2012	10:00	30.33	358	Rachel
7/9/2012	10:00	30.29	355	Rachel
7/10/2012	10:00	30.25	362	Rachel
7/15/2012	10:00	30.19	394	Rachel
7/16/2012	10:00	30.18	403	Rachel
7/17/2012	10:00	30.19	404	Rachel
7/18/2012	10:00	30.17	490	Rachel
7/23/2012	10:00	30.26	383	Rachel
7/24/2012	10:00	30.21	365	Rachel
7/25/2012	10:00	30.18	411	Rachel
7/26/2012	10:00	30.14	405	Rachel
7/27/2012	10:00	39.1	404	Lily
7/28/2012	10:00	39.21	389	Lily
7/29/2012	10:00	30.34	386	Lily
7/30/2012	10:00	30.28	397	Lily
7/31/2012	10:00	30.3	398	Rachel
Monthly Average				**393gpm**

Readings not taken on the 11th-15th or the 19th-22nd

New Security guard wasn't aware that she had to, she now understands.

Monthly Average was 400 gpm, the water meter reader was broken during the month of August. We still ran our system at a average of about 400gpm.