

# CAMECO RESOURCES CROW BUTTE OPERATION




86 Crow Butte Road  
P.O. Box 169  
Crawford, Nebraska 69339-0169

(308) 665-2215  
(308) 665-2341 – FAX

March 19, 2010

Mr. Keith I McConnell, Deputy Director  
Decommissioning and Uranium Recovery Licensing Directorate  
Division of Waste Management and Environmental Protection  
Office of Federal and State Materials and Environmental Management Programs  
Mailstop T8-F5  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Re: Source Materials License SUA-1534  
Docket No. 40-8943  
SM 6-20 Monitor Well Excursion

United States Nuclear Regulatory Commission Official Hearing Exhibit	
In the Matter of:	CROW BUTTE RESOURCES, INC. (License Renewal for the In Situ Leach Facility, Crawford, Nebraska)
	ASLBP #: 08-867-02-OLA-BD01
	Docket #: 04008943
	Exhibit #: BRD-010D-00-BD01
	Admitted: 9/10/2015
	Rejected:
Other:	Identified: 8/27/2015 Withdrawn: Stricken:

Dear Mr. McConnell:

On March 15, 2010 during routine biweekly water sampling of Cameco Resources, Crow Butte Operation (CBO) shallow monitor well SM6-20, the multiple parameter upper control limits (UCL) for conductivity and chloride were exceeded. As required by License Condition 11.2 of Source Materials License SUA-1534, a second sample was collected within 48 hours and analyzed for the three excursion indicator parameters. The results of the second sample also exceeded the multiple UCL for conductivity and chloride.

CBO notified Mr. Ronald Burrows of the excursion by phone at 3:00 PM on March 16, 2010 as required in License Condition 9.2. Laboratory results for the sample analysis for SM6-20 are attached. In addition, graphs are attached for the three excursion indicator parameters and water levels that cover the period from August 4, 2009 to March 16, 2010.

CBO believes that this apparent excursion is due to increased groundwater levels caused by the significant amount of precipitation and snow melt at the facility this spring and is not caused by mining activity. This conclusion is supported by the following indications:

1. Water level in the well has increased approximately 2 feet this spring and is currently within approximately 21 feet of the top of the well casing. SM6-20 is located in Mine Unit 6 in an area of high groundwater near the springs that form the source of English Creek. Groundwater quality in this area is under the influence of surface water. SM6-20 also went on excursion last spring when the water level climbed to 21 feet.
2. The chloride concentration has increased from normal concentrations of 7-10 mg/l to 24 mg/l. If the

CAMECO RESOURCES  
CROW BUTTE OPERATION



Mr. Keith I McConnell  
March 19, 2010  
Page 2

monitor well were affected by an excursion of mining solutions, it would be expected that the chloride concentration would be much higher due to its high concentration in the lixiviant (which typically contains chloride concentrations in excess of 500 mg/l) and its mobility in the environment.

3. There are very few injection wells in operation near SM6-20. The nearest injector that is turned on is I1698, which is nearly 200 feet away. All three mining wells within this area successfully passed a mechanical integrity test in April 2009. There have been no operational issues with these wells since the testing.

4. Nine other shallow monitor wells located in Mine Units 6, 8, and 10 are also showing increases in water levels, conductivity, and chloride concentrations. All of these wells are located in close proximity to English Creek. Historical operating data indicates that the excursion parameters are affected by high water levels in the shallow monitor wells located along English Creek.

In accordance with Section B.1 of the UIC permit, CBO will increase the sampling frequency for SM6-20 to weekly until three consecutive weekly samples are below the exceeded UCL. CBO will then continue weekly sampling for an additional three weeks after this goal has been achieved. If the well has not exceeded the UCL, it will be returned to normal status.

If you have any questions or require any further information, please do not hesitate to call me at (308) 665-2215 ext 114.

Sincerely,  
CAMECO RESOURCES  
CROW BUTTE OPERATION

*Larry Teahon*

Larry Teahon  
Manager of Safety, Health, Environment, and Quality

Enclosures: As Stated

cc: Mr. Ronald Burrows - NRC  
Mr. Joe Brister -- Director of Safety, Health, Environment and Quality  
CBO File

**CAMECO RESOURCES,  
CROW BUTTE OPERATION**



86 Crow Butte Road  
P.O. Box 169  
Crawford, Nebraska 69339-0169

(308) 665-2215  
(308) 665-2341 – FAX

March 19, 2010

Mr. Michael Linder, Director  
Nebraska Department of Environmental Quality  
PO Box 98922  
Lincoln, Nebraska 68509-8922

Subject: UIC Permit NE0122611  
SM6-20 Monitor Well Excursion

Dear Mr. Linder:

On March 15, 2010 during routine biweekly water sampling of Cameco Resources, Crow Butte Operation (CBO) shallow monitor well SM6-20, the multiple parameter upper control limits (UCL) for conductivity and chloride were exceeded. As required by Section B.1 of Part II of UIC Permit NE0122611, a second sample was collected within 24 hours and analyzed for the three excursion indicator parameters. The results of the second sample also exceeded the multiple UCL for conductivity and chloride.

CBO notified Mr. Dave Carlson of the excursion at 3:00 PM on March 16, 2010 in person. Ms. Jennifer Abrahamson was notified of the excursion by phone at 3:00 PM on March 16, 2010. As required by Section B.1, laboratory results for the sample analysis for SM6-20 are attached. In addition, graphs are attached for the three excursion indicator parameters and water levels that cover the period from August 4, 2009 to March 16, 2010.

CBO believes that this apparent excursion is due to increased groundwater levels caused by the significant amount of precipitation and snow melt at the facility this spring and is not caused by mining activity. This conclusion is supported by the following indications:

1. Water level in the well has increased approximately 2 feet this spring and is currently within approximately 21 feet of the top of the well casing. SM6-20 is located in Mine Unit 6 in an area of high groundwater near the springs that form the source of English Creek. Groundwater quality in this area is under the influence of surface water. SM6-20 also went on excursion last spring when the water level climbed to 21 feet.
2. The chloride concentration has increased from normal concentrations of 7-10 mg/l to 24 mg/l. If the monitor well were affected by an excursion of mining solutions, it would be expected that the chloride concentration would be much higher due to its high concentration in the lixiviant (which typically contains chloride concentrations in excess of 500 mg/l) and its mobility in the environment.
3. There are very few injection wells in operation near SM6-20. The nearest injector that is turned on is

**CAMECO RESOURCES,  
CROW BUTTE OPERATION**



---

Mr. Michael Linder  
March 19, 2010  
Page 2

I1698, which is nearly 200 feet away. All three mining wells within this area successfully passed a mechanical integrity test in April 2009. There have been no operational issues with these wells since the testing.

4. Nine other shallow monitor wells located in Mine Units 6, 8 and 10 are also showing increases in water levels, conductivity, and chloride concentrations. All of these wells are located in close proximity to English Creek. Historical operating data indicates that the excursion parameters are affected by high water levels in the shallow monitor wells located along English Creek.

In accordance with Section B.1 of the UIC permit, CBO will increase the sampling frequency for SM6-20 to weekly until three consecutive weekly samples are below the exceeded UCL. CBO will then continue weekly sampling for an additional three weeks after this goal has been achieved. If the well has not exceeded the UCL, it will be returned to normal status.

If you have any questions or require any further information, please do not hesitate to call me at (308) 665-2215 ext 114.

Sincerely,  
CAMECO RESOURCES  
CROW BUTTE OPERATION

Larry Teahon  
Manager of Safety, Health, Environment, and Quality

Enclosures: As Stated

cc: Mr. Dave Carlson, NDEQ Chadron Field Office  
Mr. Joe Brister – Director of Safety, Health, Environment and Quality  
CBO File

Sample Date 3/15/2010  
Analysis Date 3/15/2010

## Crow Butte Project Monitor Well Laboratory Report

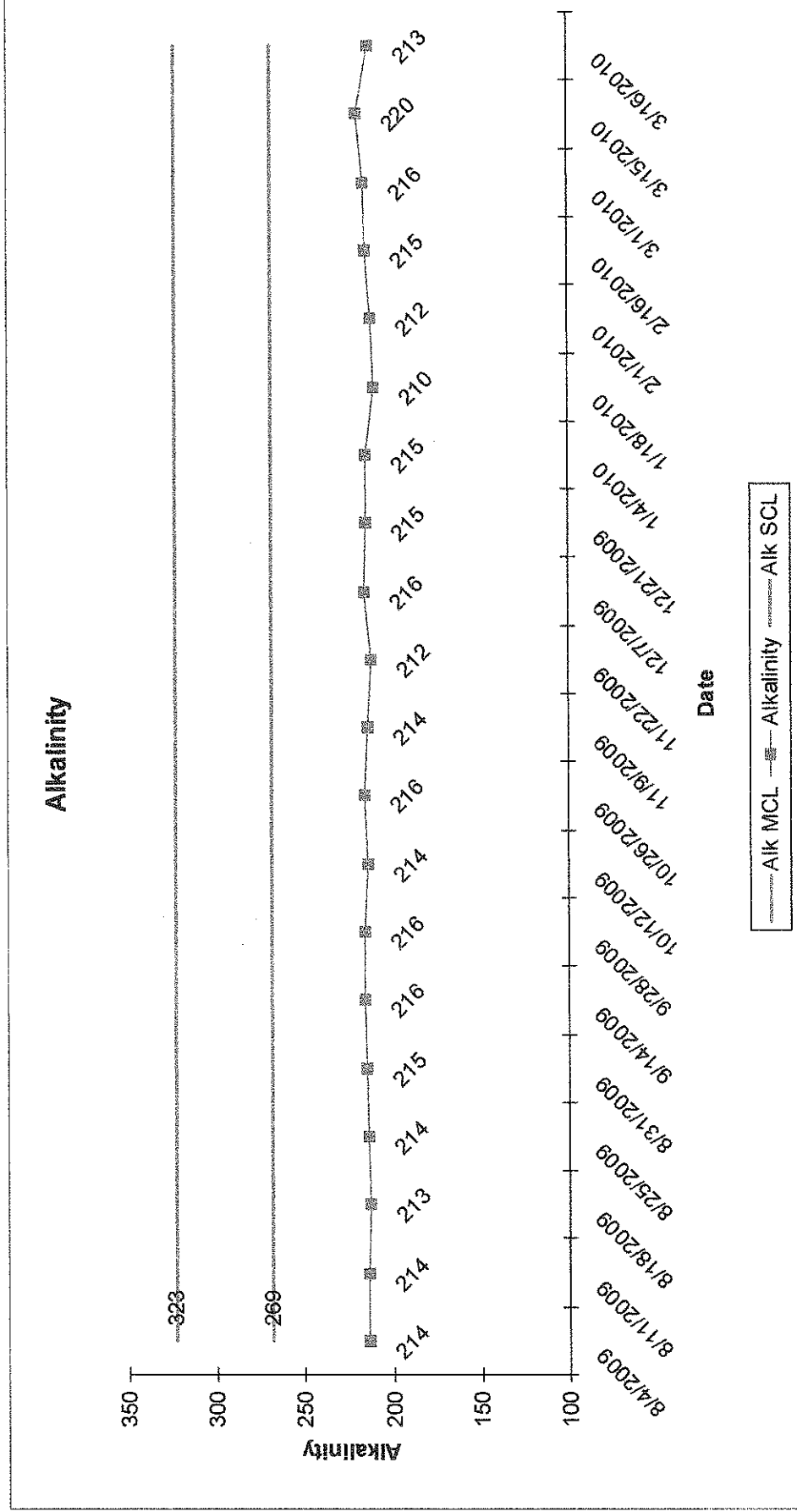
Well ID	Alkalinity			Conductivity			Chloride		
	(mg/L)	Alk SCL	Alk MCL	(µmho/cm)	Cond SCL	Cond MCL	(mg/L)	Cl SCL	Cl MCL
SM5-25	174	264	220	470	724	604	7.3	31	26
SM6-11	212	318	265	490	691	576	8	24	20
SM6-12	243	348	290	520	736	613	7.1	23	19
SM6-13	237	360	300	540	768	640	6	26	21
SM6-14	205	301	251	560	936	780	13	58	48
SM6-15	208	321	268	550	842	702	13	34	28
SM6-16	211	317	264	450	840	700	3.8	31	26
SM6-18	201	305	254	560	837	697	16	33	27
SM6-19	207	297	247	510	698	582	8.8	27	22
SM6-20	220	323	269	640	717	598	24	26	22
SM6-21	213	312	260	560	713	594	15	25	21
SM6-22	213	310	258	470	674	562	6	22	18
SM8-1	236	374	312	510	763	636	5.6	25	21
SM8-2	236	353	294	510	778	648	5.2	24	20
SM8-3	228	331	276	500	720	600	6	24	20
SM8-4	227	323	269	510	819	683	7.3	25	21
SM8-5	240	346	288	570	749	624	8.7	23	19
SM8-6	233	328	274	710	734	612	9.7	23	19

Sample Date 3/16/2010  
Analysis Date 3/16/2010

## Crow Butte Project Monitor Well Laboratory Report

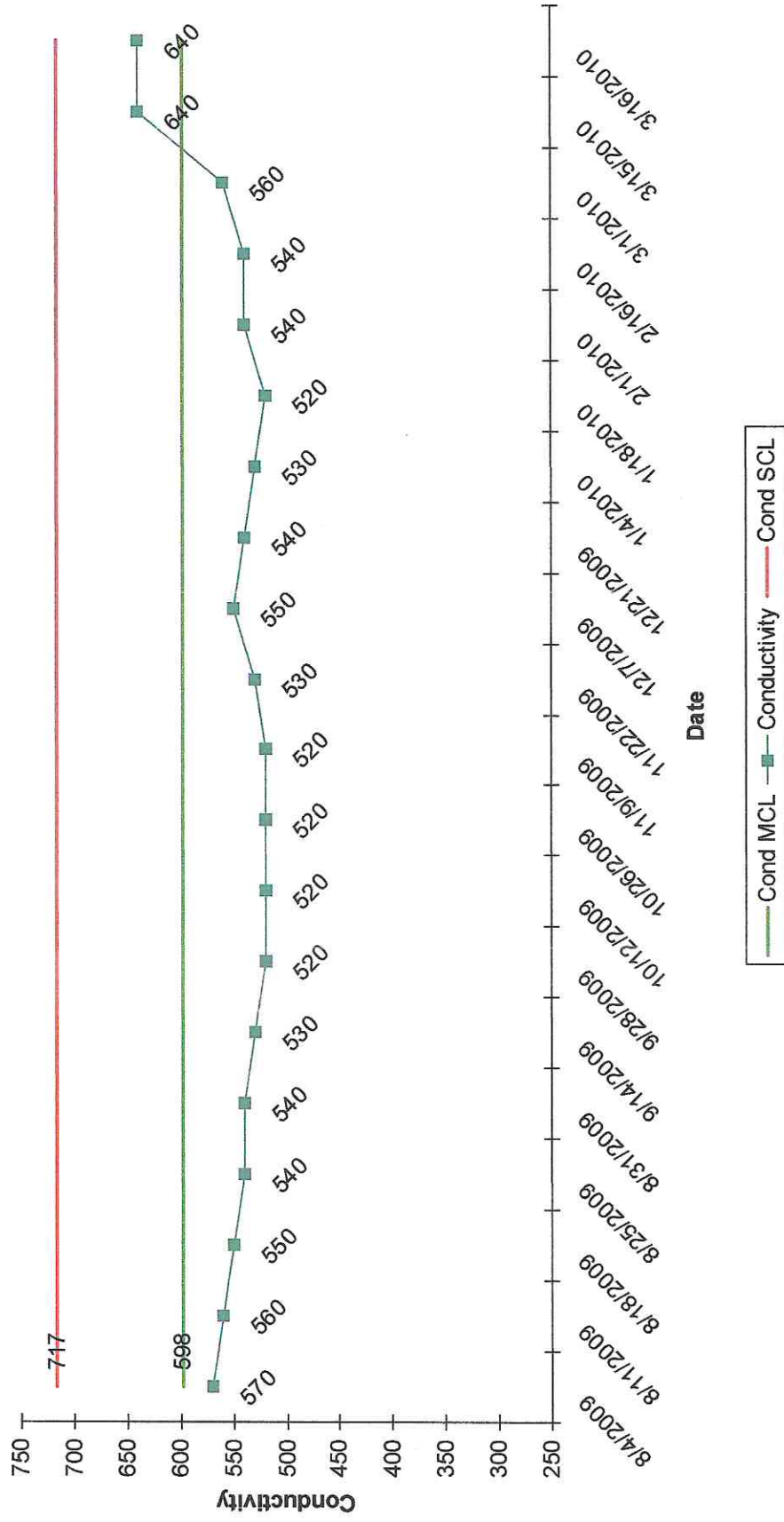
Well ID	Alkalinity			Conductivity			Chloride		
	(mg/L)	Alk SCL	Alk MCL	(µmho/cm)	Cond SCL	Cond MCL	(mg/L)	Cl SCL	Cl MCL
SM5-1	234	363	302	610	1032	860	13	57	47
SM5-2	191	287	239	460	714	595	6.2	27	22
SM5-3	230	351	293	600	1048	874	14	81	68
SM5-4	209	327	272	570	973	811	19	66	55
SM5-5	236	367	306	610	1041	868	12	65	54
SM5-6	213	324	270	540	922	768	13	47	39
SM5-7	213	323	269	580	932	776	10	41	34
SM5-8	207	312	260	560	840	700	14	32	27
SM6-20	213	323	269	640	717	598	23	26	22
SM8-10	223	331	276	580	749	624	8.3	24	20
SM8-11	220	323	269	530	792	660	7.3	24	20
SM8-12	227	323	269	550	834	695	7.6	25	20
SM8-13	225	328	274	540	880	733	11	31	26
SM8-14	219	325	271	560	720	600	13	24	20
SM8-15	216	305	254	520	789	658	7.6	35	29
SM8-16	214	331	276	510	828	690	7.9	24	20
SM8-7	237	348	290	600	763	636	8.1	23	19
SM8-8	236	340	283	510	864	720	5.5	24	20
SM8-9	237	353	294	500	886	738	5.4	23	19

# SM6-20



# SM6-20

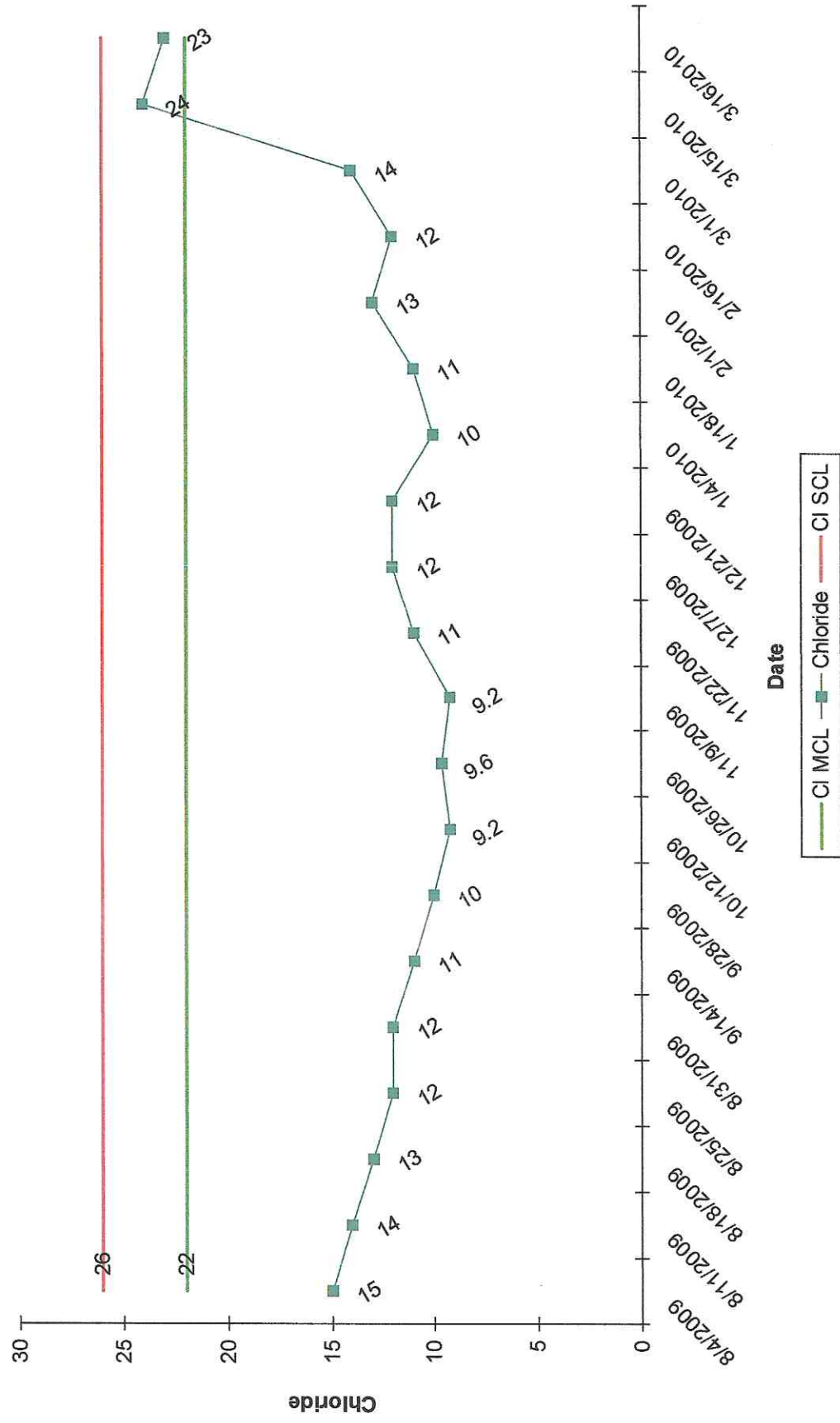
## Conductivity





# SM6-20

Chloride



# SM6-20

## Water Level

