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February 13, 2015

Mr. Chuck Gruenenfelder
Washington State Department of Ecology
Toxics Cleanup Program
4601 N. Monroe, Suite 202
Spokane, WA 99205-1295

Subject: L-Bar Site Compliance Monitoring Program—2014 Year-End Groundwater Monitoring Data Submittal.

Dear Mr. Gruenenfelder:

On behalf of Alcoa, CH2M HILL has prepared this letter and associated attachments to summarize the groundwater monitoring results collected in 2014 as part of the *Compliance Monitoring Program* (CMP) at the L-Bar site.

The following attachments (enclosed with this letter) summarize the groundwater monitoring results from the semi-annual events performed in 2014:

Attachment A – CMP Network and October 2014 Groundwater Flow Map

Attachment B – Field Parameters for April and October 2014 Sampling Events

Attachment C – Groundwater Analytical Results for April 2014 Sampling Event

Attachment D – Groundwater Analytical Results for October 2014 Sampling Event

Attachment E – Time-Series Concentration Plots for Indicator Constituents

As shown in Attachment A, the current CMP groundwater monitoring network includes thirteen sampling locations, including twelve (12) shallow resource-protection groundwater monitoring wells and one (1) deep production well. Groundwater monitoring is conducted semi-annually at the L-Bar site as initiated in the *L-Bar Material Removal and Compliance Monitoring Work Plan* (CH2M HILL, 2001) and as modified in the *L-Bar Site Compliance Monitoring Program Sampling and Analysis Work Plan Addendum No. 1, May 2012* (CH2M HILL, 2012). Per the 2012 addendum, the primary indicator parameters (ammonia, chloride, and TDS) are consistently sampled twice (semi-annual) per year, while the secondary parameters are sampled twice per year every other year (i.e., secondary constituents are sampled during even numbered years and excluded during odd numbered years). The full suite was sampled in 2014 as summarized in Attachments C and D.

We have previously shared and discussed with you the spring groundwater levels and water quality results (collected April 22, 2014) via teleconference on July 31, 2014 with Michele Maidman, Oly McCanna, and myself. As shown in Attachment E (time-series), the fall 2014 results are generally similar to previous conditions, and in many cases, exhibiting

decreasing concentrations for many of the indicator parameters. Consistent with observations from the 2013 year-end groundwater submittal (CH2M HILL, 2014), concentrations of indicator constituents (such as chloride, ammonia, and TDS) at well SA-10 continue to show improvement over the past several years since about 2010. Conditions in the north field area, as demonstrated by observations in well P-19 and P-27, are exhibiting substantive decreases in chloride in recent years. While these are only selected examples based on visual interpretation, they do support an overall improvement in groundwater conditions in key areas following the remedial actions completed in 2004.

Alcoa understands the next periodic review for the site is scheduled for 2017, which will build upon the findings presented in the 2012 periodic review (Ecology, 2012) and include another five years of compliance monitoring observations. In response to our summer discussions and your recent correspondence (letter dated August 6, 2014 and email clarification submitted September 26, 2014), Alcoa has moved ahead with collection of supplemental data beyond the minimum CMP requirements, which consists of monthly groundwater levels to gain a better understanding of groundwater flow characteristics. In addition, it is also recognized that you have recommended a 'predictive statistical analysis' to assist with evaluation of remedy performance in the next periodic review.

CH2M HILL understands that the surface water monitoring data collected in 2014 has previously been submitted to Ecology by the Stevens County Conservation District. Following the sampling in 2016 and upon receipt of those results, both surface water and groundwater data will be evaluated in support of the upcoming 2017 periodic review.

Please contact me at 509-464-7200 if you have any questions about this data submittal, or if you would like to discuss the status of the L-Bar site groundwater remediation project.

Sincerely,

CH2M HILL

Craig Sauer, L.G.
Project Manager

cc: Michele Maidman/Alcoa
Johnie McCanna/Alcoa
Charlie Kessler/Stevens County Conservation District

References:

CH2M HILL. 2001. *L-Bar Material Removal and Compliance Monitoring Work Plan.*

CH2M HILL. 2011. *L-Bar Site Compliance Monitoring and Data Evaluation Report 1996 to 2011.*

CH2M HILL. 2012. *L-Bar Site Compliance Monitoring Program Sampling and Analysis Work Plan Addendum No. 1, May 2012.*

Ecology. 2012. *Periodic Review of L-Bar Site.*

CH2M HILL. (January) 2014. *L-Bar Site Compliance Monitoring Program – 2013 Year-End Groundwater Monitoring Data Submittal.*

Attachment A
CMP Network and October 2014 Groundwater Flow Map

N

0 100 200 300

SCALE 1" = 200'

1640

1635

WEST DITCH

D3

SA-14
1640.45

P-13
1640.67

SOUTH PERIMETER REMOVAL ACTION (1997)

FORMER STOCKPILES OF FLUX BAR AND FLUX BAR RESIDUE (REMOVED 1997-1999)

MAGNESITE RESIDUE PILE

SA-11
1641.92

1641.64 P-12

SANITARY LAGOON

SA-10
1642.40

P-09
1641.63

MONITORING WELL P-08 ABANDONED IN NOVEMBER, 2003 DURING COVERED PILE REMOVAL

FORMER COVERED FLUX BAR RESIDUE PILE (REMOVED 1999-2003)

L-BAR PRODUCTION WELL
N/A

GRAVEL ACCESS ROAD

ASPHALT PAVEMENT

GRAVEL ACCESS

GATE

GATE

SPRAY EVAPORATION POND

HOLDING POND

P-25
1634.13

CR3
(300' DOWNSTREAM OF WEST DITCH MOUTH)

D2

P-20B
1635.98

MAIN DITCH (CLOSED)

P-19
1633.93

COLVILLE

P-27
1633.57

P-05
1634.35

NORTH FIELD

RIVER

P-06
1634.93

CR1

U.S. 395

LEGEND

P-05 1634.35	COMPLIANCE MONITORING WELL LOCATION AND OCTOBER WATER LEVEL ELEVATION (ft)
D2	COMPLIANCE SURFACE WATER SAMPLING STATION
	MAJOR SOURCE REMOVAL AREA
	GROUNDWATER CONTOURS AND INFERRED GROUNDWATER FLOW DIRECTION

NOTE: GROUNDWATER LEVELS MEASURED ON OCTOBER 14, 2014

ATTACHMENT A
COMPLIANCE MONITORING NETWORK AND OCTOBER 2014 GROUNDWATER FLOW MAP
L-BAR SITE

CH2MHILL

Attachment B
Field Parameters for April and October 2014 Sampling Events

ATTACHMENT B

Groundwater Monitoring Field Parameter Data - April and October 2014

L-Bar Site Compliance Monitoring Program

Location	Well	Date	TOC Reference Elevation (ft) [1]	Depth to Water (ft)	Groundwater Elevation (ft)	Temp. (°C)	pH	Specific Conductance (uS/cm)
Background	P-12	4/22/2014	1649.43	4.61	1644.82	7.5	7.5	1,352
		10/14/2014		7.79	1641.64	13.1	7.5	1,297
	Prod. Well	4/22/2014	-- not applicable --			-	-	-
		10/14/2014				12.2	8.1	605
North of Site	P-05	4/22/2014	1642.99	6.41	1636.58	6.5	7.2	6,970
		10/14/2014		8.64	1634.35	10.0	6.9	7,680
	P-06	4/22/2014	1642.33	3.51	1638.82	7.3	7.1	1,179
		10/14/2014		7.40	1634.93	12.6	7.0	1,198
	P-19	4/22/2014	1640.03	2.71	1637.32	8.7	6.4	21,870
		10/14/2014		6.10	1633.93	12.5	6.3	17,200
	P-20B	4/22/2014	1642.25	4.58	1637.67	8.7	7.2	8,240
		10/14/2014		6.77	1635.48	17.2	7.2	8,050
	P-25	4/22/2014	1639.41	3.50	1635.91	7.3	6.7	2,488
		10/14/2014		5.28	1634.13	13.0	6.9	2,258
	P-27	4/22/2014	1642.19	3.47	1638.72	7.0	6.8	25,790
		10/14/2014		8.62	1633.57	12.4	6.8	24,470
Site Interior	P-09	4/22/2014	1643.81	1.81	1642.00	10.6	7.5	3,296
		10/14/2014		2.18	1641.63	9.3	8.7	2,182
	P-13	4/22/2014	1645.98	4.52	1641.46	7.9	7.5	6,720
		11/13/2014		5.31	1640.67	15.3	7.3	6,740
Magnesite Residue Pile	SA-10	4/22/2014	1672.07	28.09	1643.98	11.1	8.0	34,680
		10/14/2014		29.67	1642.40	12.2	7.9	34,910
	SA-11	4/22/2014	1668.27	25.64	1642.63	11.2	8.6	20,670
		10/14/2014		26.35	1641.92	11.9	8.8	15,630
	SA-14	4/22/2014	1666.85	26.03	1640.82	10.8	10.1	6,080
		10/14/2014		26.40	1640.45	11.4	10.0	6,440

Notes:

1. Feet above mean sea level; vertical survey datum in NAVD88. All wells were re-surveyed in October 2013 by Benthin and Associates.

Attachment C
Groundwater Analytical Results for April 2014 Sampling Event

ATTACHMENT C

April 2014 Groundwater Sampling Analytical Results

L-Bar Site Compliance Monitoring Program

Analyte	Units	--- Background ---		--- North of Site ---						--- Site Interior ---		--- Magnesite Residue Pile ---		
		P-12	PROD. WELL	P-05	P-06	P-19	P-20B	P-25	P-27	P-09	P-13	SA-10	SA-11	SA-14
Ammonia-N	mg/L	ND	ND	0.127	0.819	0.133	30.1	0.629	ND	3.02	38.4	910	78.4	23.7
Barium	mg/L	0.0487	0.0717	0.47	0.25	0.17	0.0633	0.0506	4.15	0.223	0.0452	0.0516	0.0253	0.0109
Chloride (Cl)	mg/L	11.7	0.85	2,440	128	7,470	2,120	374	9,150	683	1,200	8,230	3,330	1,030
Conductivity	uMHOS/cm	1,280	431	6,580	1,090	20,000	8,000	2,420	23,000	2,930	6,410	34,300	11,900	5,710
Manganese	mg/L	0.001 *	0.0007 J*	1.84 *	2.41 *	5.82 *	0.556 *	9.96 *	0.0126 *	0.896 *	2.59 *	4.69 *	0.0859 *	0.0069 *
Nitrate, Nitrite-N, Total CALC	mg/L	0.184	0.073	0.046 J	0.048 J	0.633	22.6	0.026 J	0.881	0.074	3.3	1.75	0.054	0.101
Nitrate-N	mg/L	0.166	0.059	0.031 J	0.03 J	0.489	22.4	ND	0.863	0.02 J	3.22	0.49	ND	ND
Nitrite-N	mg/L	0.018 J	0.014 J	0.015 J	0.018 J	0.144	0.214	0.019 J	0.018 J	0.054	0.083	1.26	0.151	0.23
pH	pH UNITS	7.99	8.23	7.6	7.41	6.67	7.54	7.28	7.33	7.99	7.83	7.6	8.71	9.69
Selenium	mg/L	ND	ND	ND	ND	0.0071 J	0.0048 J	0.0066 J	ND	ND	ND	ND	ND	0.0238
Thallium	mg/L	ND	ND	ND	ND	0.0051 J J	ND	0.0082 J	ND	ND	ND	ND	ND	ND
Total Dissolved Solids (TDS)	mg/L	852	251	3,620	603	13,900	4,450	1,570	15,100	1,450	4,310	24,800	8,060	3,780
Turbidity	NTU	1.17	--	1.87	104	53.5	2.71	47.6	3.67	--	1.05	3.64	0.67	0.37

Notes:

* = Relative Percent Difference Exceptions: The Relative Percent Difference (RPD) for the replicate analysis of Manganese in sample 1404SA14 was outside the Method control limits. The associated QA/QC results (e.g. control sample, calibration standards, etc.) indicated the analysis was in control. No further corrective action was appropriate.

Matrix Spike Recovery Exceptions: The control criteria for matrix spike recovery of Manganese for sample 1404P25 were not applicable. The analyzed concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

-- = not analyzed

J = The result is an estimated value.

ND = The result is non-detect.

Samples collected on April 22, 2014.

Attachment D
Groundwater Analytical Results for October 2014 Sampling Event

ATTACHMENT D

October/November 2014 Groundwater Sampling Analytical Results

L-Bar Site Compliance Monitoring Program

Analyte	Units	--- Background ---		--- North of Site ---						--- Site Interior ---		--- Magnesite Residue Pile ---		
		P-12	PROD. WELL	P-05	P-06	P-19	P-20B	P-25	P-27	P-09	P-13	SA-10	SA-11	SA-14
Ammonia-N	mg/L	ND	ND	ND	0.813	0.525	29.2	0.228	ND	0.422	40.7	800	79	20
Barium	mg/L	0.0489	0.0746	0.503	0.395	0.114	0.0777	0.0415	3.43	0.0679	0.0647	0.0585	0.0336	0.0117
Chloride	mg/L	11.2	0.945	1,170	135	2,670	1,100	288	8,880	407	1,020	8,060	1,830	0,897
Conductivity	µmhos/cm	1,330	460	7,839	1,161	21,400	9,025	2,330	30,500	2,310	7,050	50,100	18,700	5,810
Manganese	mg/L	0.00243	ND	0.895	1.46	3.09	0.782	4.51	0.00819	0.0673	3.32	4.14	0.127	0.00387
Nitrate-N	mg/L	0.14	ND	ND	ND	ND	11.6	ND	ND	ND	2.64	ND	ND	ND
Nitrite-N	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pH	ph Units	7.58	7.74	7.06	6.96	6.51	7.14	6.96	6.96	8.65	7.3	7.62	8.58	9.75
Selenium	mg/L	0.00119	ND	0.00553	ND	0.00619	0.00581	ND	0.00858	ND	0.00466	0.0121	0.00699	0.0296
Thallium	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Dissolved Solids (TDS)	mg/L	898	432	4,070	634	9,430	4,890	1,320	14,000	1,060	5,210	25,200	9,480	3,464
Turbidity	NTU	0.124	ND	0.964	38,200	3.48	1.19	59.4	2.27	0.262	5.03	15	0.609	0.134

Notes:

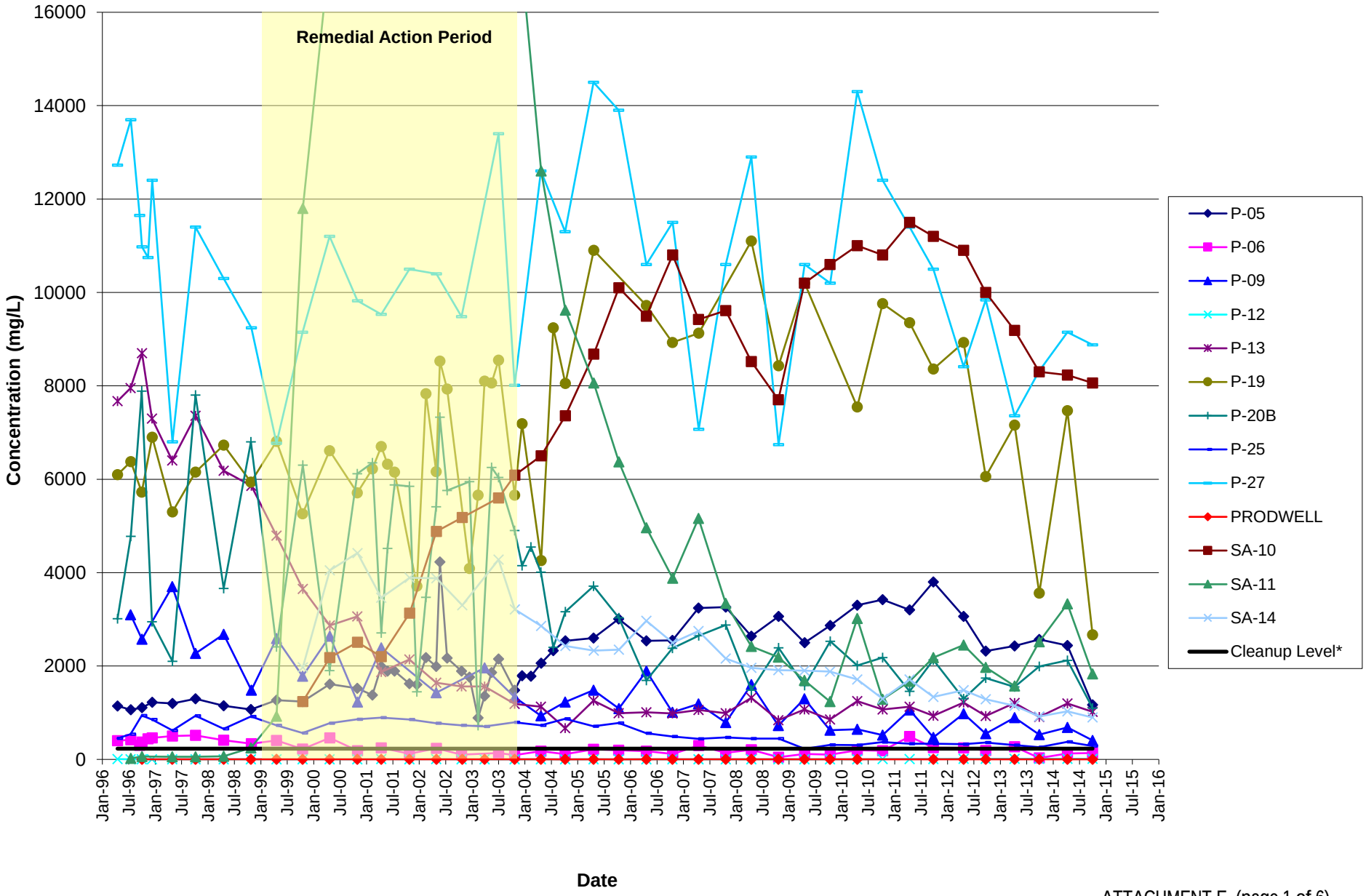
-- = not analyzed

J = The result is an estimated value.

ND = The result is non-detect.

Samples collected on October 14, and November 13, 2014.

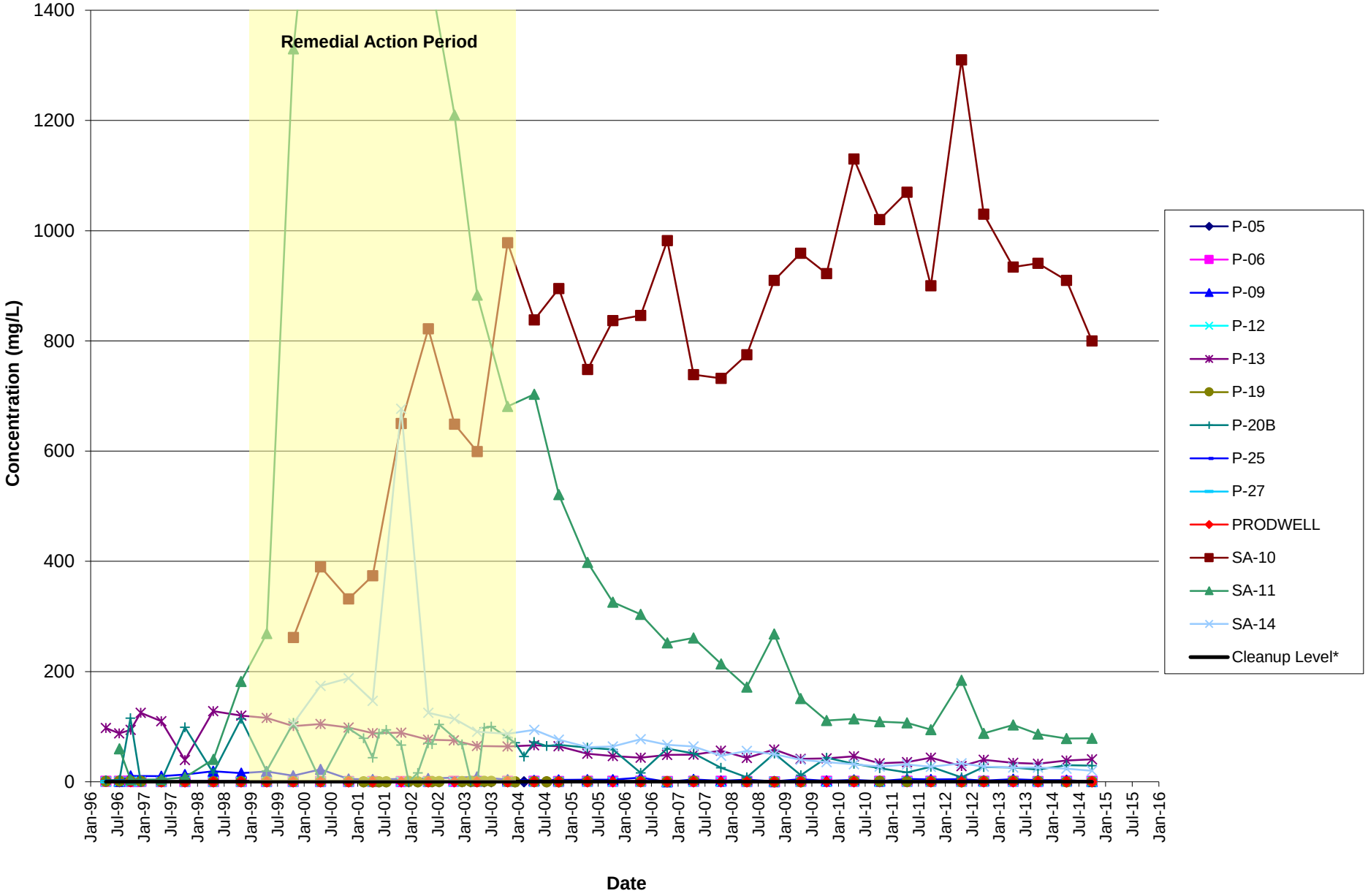
Attachment E
Time-Series Concentration Plots for Indicator Constituents



Notes:

1. Remedial Action Period 1999 -2003; Magnesite Residue Pile Removal in 1999, Covered Pile Removal in 2003, and Main Ditch Closure in 2003.
2. Concentration scale truncated - some high values not shown for well SA-11
3. *Site-Specific Cleanup Level for Chloride is 230 mg/L; reference *L-Bar Cleanup Levels Development and Feasibility Study Report (CH2M HILL, 1999).*

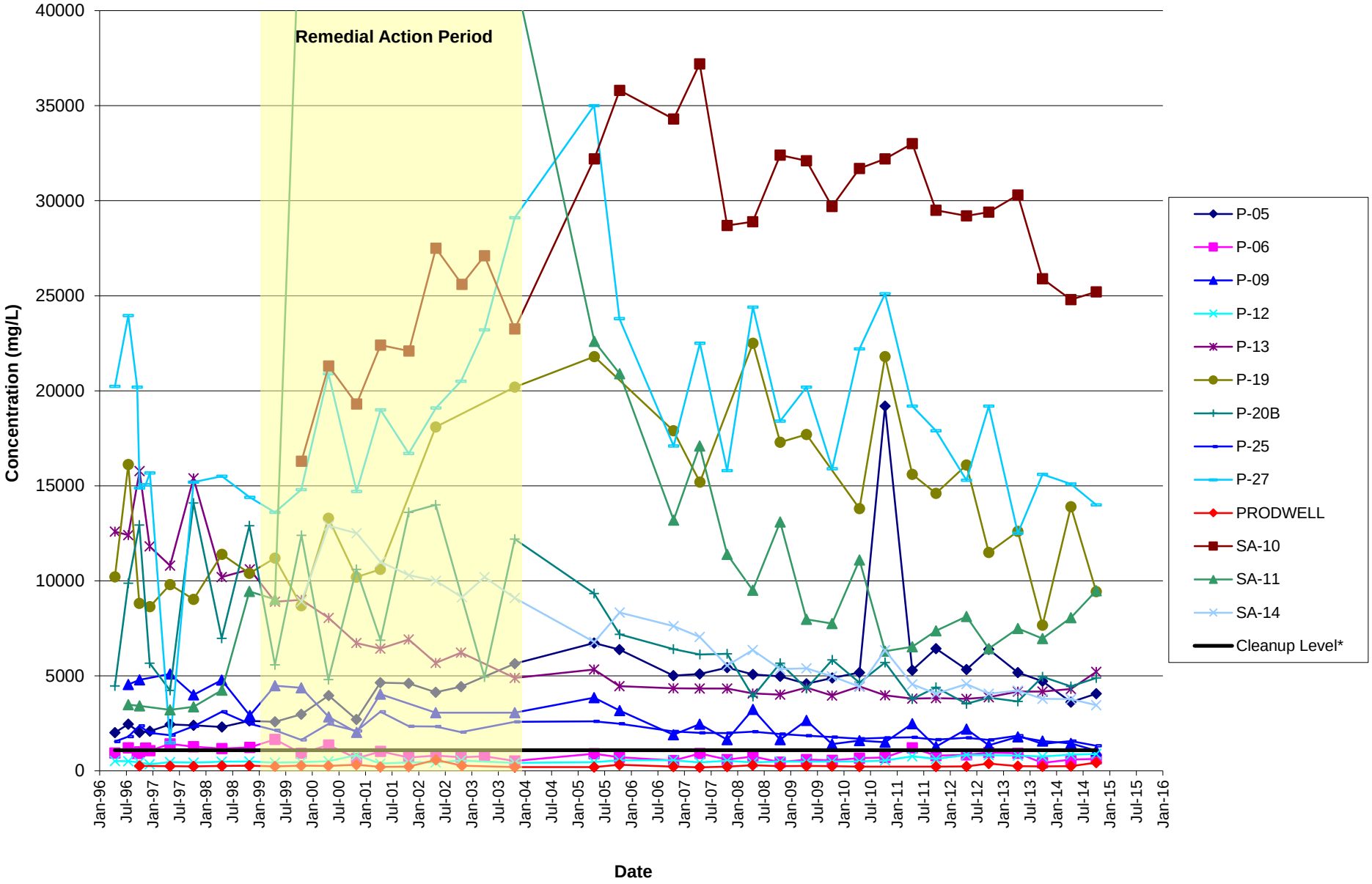
ATTACHMENT E (page 1 of 6)
Chloride Concentrations
L-Bar Site
CH2M HILL



Notes:

1. Remedial Actions Performed from 1999 to 2003; Magnesite Residue Pile Removal in 1999, Covered Pile Removal in 2003, and Main Ditch Closure in 2003.
2. Concentration scale truncated - some high values not shown for well SA-11
3. *Site-Specific Cleanup Level for Ammonia is 0.13 mg/L; reference *L-Bar Cleanup Levels Development and Feasibility Study Report (CH2M HILL, 1999).*

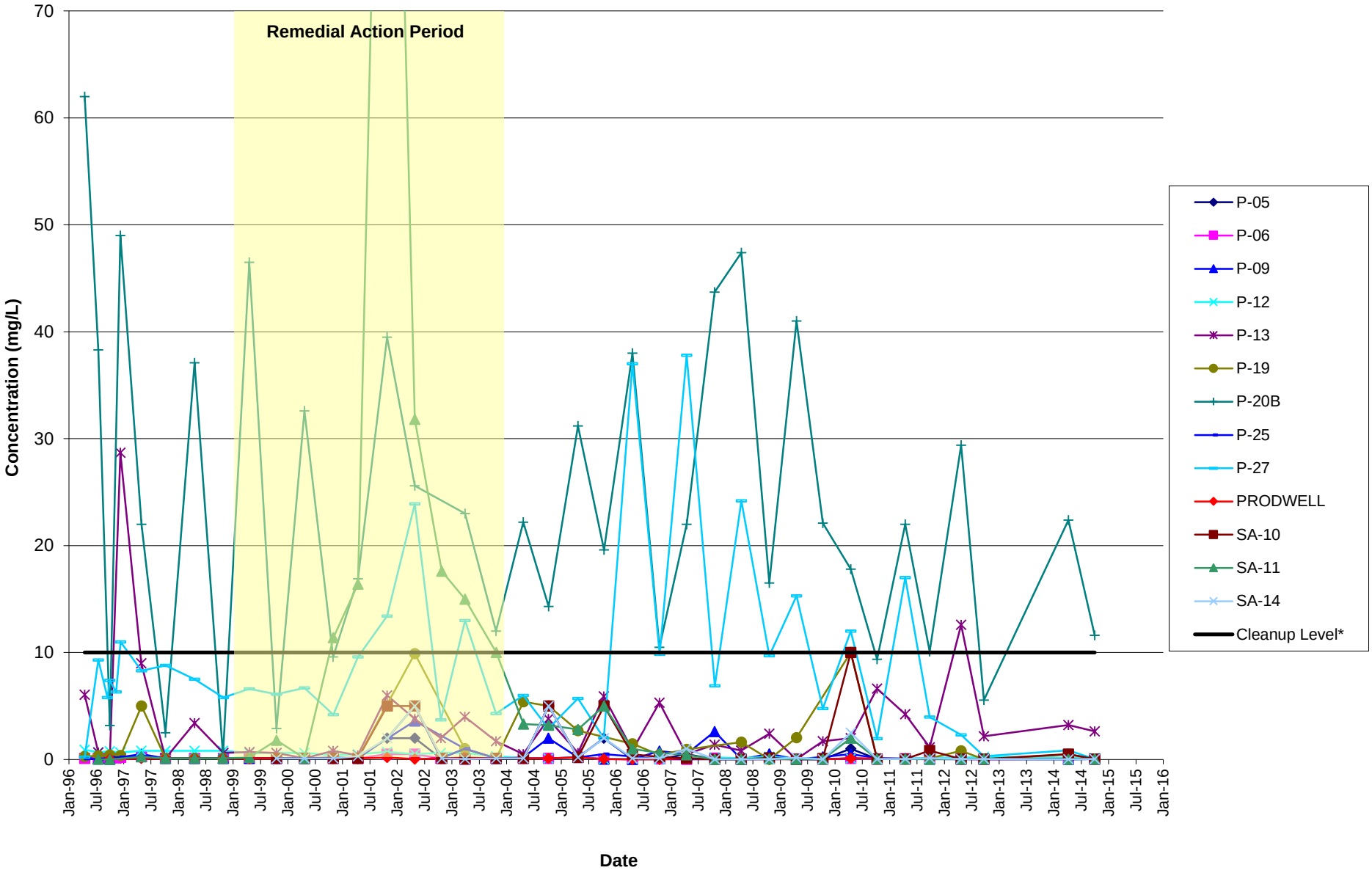
ATTACHMENT E (page 2 of 6)
Ammonia Concentrations
L-Bar Site
CH2M HILL



Notes:

1. Remedial Actions Performed from 1999 to 2003; Magnesite Residue Pile Removal in 1999, Covered Pile Removal in 2003, and Main Ditch Closure in 2003.
2. Concentration scale truncated - some high values not shown.
3. *Site-Specific Cleanup Level for TDS is 1092.4 mg/L; reference *L-Bar Cleanup Levels Development and Feasibility Study Report (CH2M HILL, 1999).*

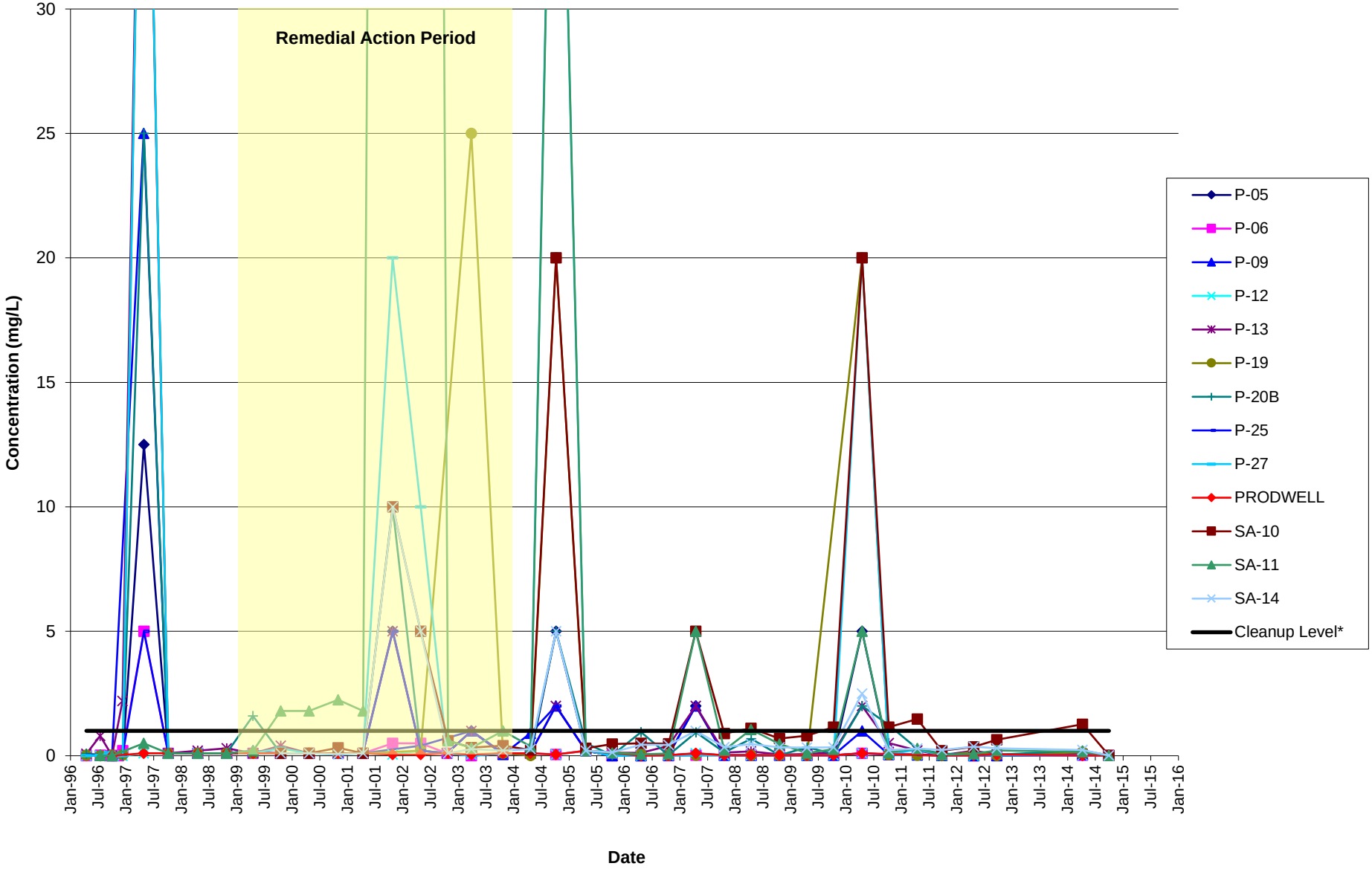
ATTACHMENT E (page 3 of 6)
Total Dissolved Solids
L-Bar Site
CH2M HILL



Notes:

1. Remedial Actions Performed from 1999 to 2003; Magnesite Residue Pile Removal in 1999, Covered Pile Removal in 2003, and Main Ditch Closure in 2003.
2. Concentration scale truncated - some high values not shown for well SA-11.
3. *Site-Specific Cleanup Level for Nitrate is 10.0 mg/L; reference *L-Bar Cleanup Levels Development and Feasibility Study Report (CH2M HILL, 1999).*

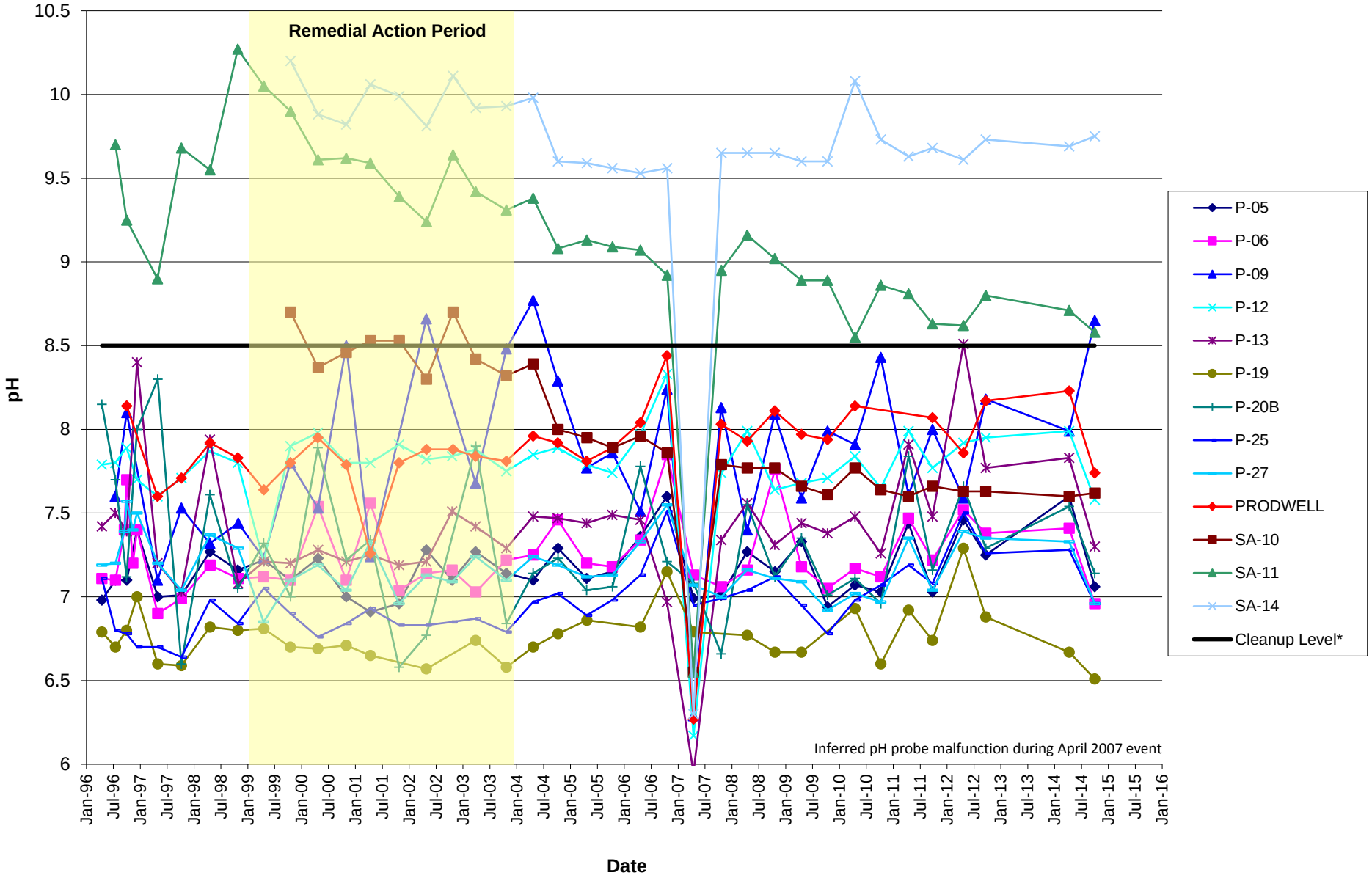
ATTACHMENT E (page 4 of 6)
Nitrate Concentrations
L-Bar Site
CH2M HILL



Notes:

1. Remedial Actions Performed from 1999 to 2003; Magnesite Residue Pile Removal in 1999, Covered Pile Removal in 2003, and Main Ditch Closure in 2003.
2. Concentration scale truncated - some high values not shown.
3. *Site-Specific Cleanup Level for Nitrite is 1.0 mg/L; reference *L-Bar Cleanup Levels Development and Feasibility Study Report (CH2M HILL, 1999).*

ATTACHMENT E (page 5 of 6)
Nitrite Concentrations
L-Bar Site
CH2M HILL



Notes:

1. Remedial Actions Performed from 1999 to 2003; Magnesite Residue Pile Removal in 1999, Covered Pile Removal in 2003, and Main Ditch Closure in 2003.
2. *Site-Specific Cleanup Level for pH is 8.5 mg/L; reference *L-Bar Cleanup Levels Development and Feasibility Study Report (CH2M HILL, 1999).*

ATTACHMENT E (page 6 of 6)
pH
L-Bar Site
CH2M HILL