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BHCTP Monthly Discharge Monitoring Report

Month: October-17

Facility: Central Treatment Plant

Location: Bunker Hill Superfund Site

Contract Number: W912DW-16-C-0012 Amec Foster Wheeler

Total Flow For The Month From 006 Outfall:	42,450,200	gallons
Sludge pumping to CIA sludge pond:	1,278,000	gallons
Total Flow From Kellogg Tunnel:	43,469,300	gallons

Percent of Influent Successfully Treated: 100.0%

8 sample days * 6 parameters (Pb, Cd, Zn, Mn, TSS & pH) = 48 potential exceedances
48 - 0 exceedances = 48 48/48 = 100%

Results of Sampling Efforts:

All sampling has been performed in accordance with specifications and the Sampling and Analysis Plan.

Performance Evaluation (PE) sampling was not performed for this reporting period.

Trip blank and rinsate sampling was performed, with the results being reported on the 'PTM-004,RB,TB' page of this DMR.

Highlights of Plant Maintenance and/or Plant Optimization:

10-01-17 Performed monthly fire extinguisher inspection. All CTP fire extinguishers are fully charged and in good working condition at this time.

10-01-17 Performed monthly pump and motor inspection. All CTP pumps and motors are in good condition at this time.

10-02-17 4:40 - 13:00 Operators performed a lined storage pond pumping event to decreased the water volume. The lined storage pond level is being decreased to support the lime slurry holding tank project.

10-03-17 4:40 - 13:00 Operators performed a lined storage pond pumping event to decreased the water volume. The lined storage pond level is being decreased to support the lime slurry holding tank project.

10-08-17 10:30 Mine pool pump was removed from service by the mine personnel. Kt flow decreased from approximately 1740 gpm to approximately 700 gpm.

10-08-17 23:00 Mine discharge flow decreased from approximately 700 gpm to approximately 175 gpm.

10-09-17 04:00-06:00 Activated the #3 lined pond pump in an attempt to utilize the 5' of lime slurry remaining in the lime tank.

10-09-17 14:00 Placed CTP in shutdown mode, diverted KT flow of approximately 150 gpm to the lined storage pond.
06:00 CTP operator obtained a water truck and portable pump to remove the remaining lime slurry.
Approximately 4000 gallons of lime slurry was transferred to and wasted at the CIA sludge pond.

10-09-17 CTP operators performed lime system de-energizing and lock out - tag out on all lime slurry tank components.
09:15 The CTP operators turned the lime slurry tank over to the FCI labor crew for entry and cleaning.

10-10-17 CTP operators performed lime system de-energizing and lock out - tag out on all lime slurry tank components.
Operators performed the monthly no load emergency generator run test. The emergency generator operated for thirty minutes as programmed with no issues or errors to report.
Operators performed the scheduled Clarifier underflow back flush, Rapid Mix Tank draining and inspection, sludge

discharge line draining and sludge discharge line flushing. All components inspected were found in good condition.
Daily KT discharge flow verification indicated the KT flow remains at 130 gpm at this time.
Lined storage pond water volume is 750,000 gallons at this time.

10-11-17 CTP operators performed lime system de-energizing and lock out - tag out on all lime slurry tank components.
09:45 LWTPO energized the power supply for Mine Fabrication welding equipment.
09:45 All lock out and tag out responsibilities associated with the lime slurry holding tank project were assumed by Khalfani Lee of Amec F.W.
Daily KT discharge flow verification indicated the KT flow remains at 130 gpm at this time.
Lined storage pond water volume is slightly less than 1,000,000 gallons at this time.

10-12-17 CTP operators cleaned and inspected the KT concrete flume and trash racks. Operator were able to photograph the deteriorating lower section of the concrete flume as the mine discharge is at 130 gpm.
The pitting and deteriorated lower section of the concrete flume has been reported on the CTP open channel inspection report beginning April 2016 during a low flow event.
Lined storage pond water volume remains at approximately 1,000,000 gallons at this time.

10-20-17 The lined storage pond level is currently at 3.00mg (2272.0' elevation).
16:00 The KT flow increased from approximately 150 gpm to 670 gpm at gravity flow only.

10-20-17 The final inspection was performed on the lime slurry holding tank. The lime slurry holding tank was turned over to the CTP operators at 09:30. CTP operators removed all lock-out/tag-out devices. All pumps and motors were tested and placed into service. The lime slurry system was placed into service. 10:00 The CTP was placed into service with influent from the lined storage pond.

10-21-17 06:00 The CTP influent is now direct feed from the KT discharge at a flow of 650 gpm.

10-23-17 08:25-13:25 CTP operators performed lined storage pond pumping as the KT flow remains at 650 gpm.
Lined storage pond volume prior to pumping was 1.50 mg.
Operators removed the pond pump from service for approximately fifteen minutes to remove debris from the pump inlet screen. Leaves plugged the inlet screen and reduced the pump capacity.

10-24-17 05:45-12:00 CTP operators performed lined storage pond pumping as the KT flow remains at 650 gpm.
Lined storage pond volume prior to pumping was 1.25 mg.
Operators removed the pond pump from service for approximately fifteen minutes to remove debris from the pump inlet screen. Leaves plugged the inlet screen and reduced the pump capacity.
Operators dismantled, cleaned and reassembled the lime slurry holding tank overflow and drain pipelines.
The pipelines were observed to have scale buildup during the final lime tank inspection October 20th.

10-24-17 Operators performed the monthly full load emergency generator run test. The emergency generator operated all CTP components for one hour as programmed with no issues or errors to report.

10-25-17 Performed quarterly direct feed line cleaning (pigging) event. A completed quarterly AMD direct feed line cleaning report was submitted with the BHCTP daily QC report October 25, 2017.

10-31-17 Performed monthly reset of the KT and treated outfall flow meters. Documented monthly totals on the KT & 006 flow page of this report.

- The Kellogg Tunnel discharge flow decreased by 16% from October 2016, from 52.4 mg to 43.5 mg.

- The Kellogg Tunnel zinc concentration increased by 1% from October 2016, from an average of 52 mg/L to 53 mg/L.

- The CTP operating pH set point was decreased from 8.6 to 8.4 briefly during this reporting period.

- The flocculent dosage remained at approximately 1.6 PPM during this reporting period.

- The CTP sludge recycle rate remained at 400 gpm.

- CTP operators received no off-shift auto dialer call-out alarms.

- CTP operators performed six pumping events from the Lined Pond.

- CTP operators verified Aeration Basin pH probe and grab sample values twice per day.

No significant lessons to report for last month.

Lessons Learned

MONITORING PERIOD						
YEAR	MO	DAY		YEAR	MO	DAY
2017	10	1		2017	10	31

PARAMETER		Quantity or Loading			Quality or Concentration					
		MONTHLY AVERAGE	DAILY MAXIMUM	UNITS	MINIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS	FREQUENCY OF ANALYSIS	SAMPLE TYPE
pH	Sample Measurement				6.83		7.07		Continuous	Meter
	Permit Required				6.0		10.0			
Flow Thru Treatment Plant	Sample Measurement	1.37	2.67	mgd						
	Permit Required		Daily							
Lead Total - Pb Effluent	Sample Measurement	0.04	0.06	lbs/day		0.003	0.003	mg/L	three samples/ week	Comp 24
	Permit Required	14.8	37.0			0.30	0.60	mg/L		
Zinc Total - Zn Effluent	Sample Measurement	2.29	4.33	lbs/day		0.16	0.20	mg/L	three samples/ week	Comp 24
	Permit Required	36.2	91.3			0.73	1.48	mg/L		
Cadmium - Cd Effluent	Sample Measurement	0.05	0.120	lbs/day		0.003	0.006	mg/L	three samples/ week	Comp 24
	Permit Required	2.40	6.10			0.050	0.100	mg/L		
Manganese - Mn Effluent	Sample Measurement	321	737	lbs/day		20.4	36.2	mg/L	three samples/ week	Comp 24
	No Permit Required					N/A	N/A	mg/L		
Total Suspended Solids - TSS	Sample Measurement	17.0	43	lbs/day		1.4	2.0	mg/L	three samples/ week	Comp 24
	Permit Required	985	1907			20	30	mg/L		

PREPARED BY: GARY FULTON

REVIEWED BY: BRIAN JOHNSON

NPDES DISCHARGE POINT 006
CENTRAL TREATMENT PLANT
MONTH: Oct-17

DAY	LEAD (Pb)		ZINC (Zn)		CADMIUM (Cd)		MANGANESE (Mn)		pH	FLOW	TSS		LOADING
	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day		mgd	mg/L	lbs/day	kg/day
1		0.053		3.52		0.06		475		2.46		24.6	11.1
2	0.0026	0.053	0.172	3.48	0.0030	0.06	23.2	469	6.99	2.42	1.2	24.3	11.0
3		0.058		3.84		0.07		518		2.67		26.8	12.1
4	0.0026	0.056	0.202	4.33	0.0056	0.12	32.0	686	6.98	2.57	2.0	42.9	19.5
5		0.052		4.02		0.11		637		2.39		39.8	18.1
6	0.0026	0.053	0.201	4.06	0.0040	0.08	36.2	731	6.90	2.42	1.6	32.3	14.7
7		0.053		4.09		0.08		737		2.44		32.6	14.8
8		0.053		4.08		0.08		735		2.43		32.5	14.7
9	0.0026	0.017	0.198	1.30	0.0041	0.03	32.4	213	7.07	0.79	0.6	3.95	1.79
10*		0.017		1.30		0.03		213		**0.00**		3.95	1.79
11*		0.017		1.30		0.03		213		**0.00**		3.95	1.79
12*		0.017		1.30		0.03		213		**0.00**		3.95	1.79
13*		0.017		1.30		0.03		213		**0.00**		3.95	1.79
14*		0.017		1.30		0.03		213		**0.00**		3.95	1.79
15*		0.017		1.30		0.03		213		**0.00**		3.95	1.79
16*		0.017		1.30		0.03		213		**0.00**		3.95	1.79
17*		0.017		1.30		0.03		213		**0.00**		3.95	1.79
18*		0.017		1.30		0.03		213		**0.00**		3.95	1.79
19*		0.017		1.30		0.03		213		**0.00**		3.95	1.79
20*		0.017		1.30		0.03		213		**0.00**		3.95	1.79
21		0.043		3.30		0.07		541		2.00		10.01	4.54
22		0.021		1.58		0.03		259		0.96		4.80	2.18
23	0.0026	0.019	0.138	1.03	0.0026	0.02	9.19	68.3	6.99	0.89	1.6	11.9	5.40
24		0.027		1.42		0.03		94.3		1.23		16.4	7.45
25	0.0026	0.050	0.145	2.79	0.0025	0.05	3.27	62.9	6.96	2.30	1.6	30.8	14.0
26		0.053		2.94		0.05		66.3		2.43		32.4	14.7
27	0.0026	0.054	0.119	2.48	0.0023	0.05	11.9	248	6.83	2.50	1.4	29.2	13.2
28		0.052		2.38		0.05		238		2.40		28.0	12.7
29		0.054		2.46		0.05		246		2.48		28.9	13.1
30	0.0026	0.051	0.094	1.84	0.0013	0.03	15.0	294	6.96	2.35	0.8	15.69	7.12
31		0.050		1.82		0.03		290		2.32		15.49	7.02
Total	0.0208	1.1091	1.2690	71.1005	0.0254	1.4259	163.1600	9,954	55.6800	42.4502	10.8000	526.7820	238.9034
Sample Events	8	31	8	31	8	31	8	31	8	31	8	31	31
Daily Average	0.003	0.036	0.159	2.29	0.003	0.046	20.4	321	6.96	1.37	1.35	17.0	7.71
Lab Detection Limit	**0.0026**		**0.004**		**0.0004**		**0.0025**		**0.01**		**0.800**		

MIN	0.003	0.017	0.094	1.026	0.001	0.019	3.270	62.886	6.830	0.000	0.600	3.946	1.789
MAX	0.003	0.058	0.202	4.332	0.006	0.120	36.200	737.097	7.070	2.674	2.000	42.893	19.453

Notes:
***No CTP discharge flow October 10th - October 20 in support of the Lime Slurry Holding Tank Repair Project.**
(X mg/L) * (1 kg/10^6 mg) * (2.205 lbs/kg) * (3.785 L/gal) * (10^6 gal/Mgal) * (Y Mgal/day) = (X) * (Y) * (8.345) in lbs/day
(X lbs/day) * (1 kg/2.205 lbs) = (X) / (2.205) in kg/day
verified by Brian Johnson, 11/14/17

KELLOGG TUNNEL DISCHARGE
CENTRAL TREATMENT PLANT
MONTH: Oct-17
Data from SVL

DAY	LEAD (Pb)		ZINC (Zn)		CADMIUM (Cd)		MANGANESE (Mn)		pH s.u.	006 FLOW	TSS		
	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	***SVL Lab***	mgd	mg/L	lbs/day	kg/day
1		12.0		1,260		1.88		2,151		2.46		1885	854.8
2	0.588	11.9	61.5	1,244	0.0920	1.86	105	2,124	3.18	2.42	92.0	1861	844.0
3		13.1		1,372		2.05		2,343		2.67		2053	931.0
4		12.6		1,319		1.97		2,252		2.57		1973	894.8
5	0.568	11.3	59.6	1,187	0.0929	1.85	103	2,052	3.26	2.39	75.0	1494	677.5
6		11.5		1,204		1.88		2,080		2.42		1515	686.9
7		11.6		1,214		1.89		2,097		2.44		1527	692.6
8		11.5		1,210		1.89		2,091		2.43		1522	690.4
9	0.524	3.45	39.1	257.1	0.0758	0.50	36.8	242.0	3.13	0.79	6.0	39.46	17.89
10		3.45		257.1		0.50		242.0		0.00		39.46	17.89
11		3.45		257.1		0.50		242.0		0.00		39.46	17.89
12	0.462	3.04	14.8	97.32	0.0246	0.16	29.5	194.0	3.40	0.00	12.0	78.91	35.79
13		3.04		97.32		0.16		194.0		0.00		78.91	35.79
14		3.04		97.32		0.16		194.0		0.00		78.91	35.79
15		3.04		97.32		0.16		194.0		0.00		78.91	35.79
16	0.401	2.64	11.6	76.28	0.0161	0.11	30.0	197.3	3.61	0.00	7.0	46.03	20.88
17		2.64		76.28		0.11		197.3		0.00		46.03	20.88
18		2.64		76.28		0.11		197.3		0.00		46.03	20.88
19	0.466	3.06	10.6	69.70	0.0164	0.11	29.8	196.0	3.67	0.00	3.0	19.73	8.947
20		3.06		69.70		0.11		196.0		0.00		19.73	8.947
21		7.78		176.9		0.27		497.4		2.00		50.07	22.71
22		3.73		84.74		0.13		238.2		0.96		23.98	10.88
23	0.530	3.94	94.7	704.1	0.178	1.32	34.5	256.5	2.90	0.89	40.0	297.4	134.9
24		5.44		972.0		1.83		354.1		1.23		410.6	186.2
25		10.2		1,821		3.42		663.5		2.30		769.2	348.9
26	0.675	13.7	64.1	1,300	0.0808	1.64	131	2,656	3.30	2.43	76.0	1541.2	698.9
27		14.1		1,337		1.69		2,733		2.50		1585.6	719.1
28		13.5		1,284		1.62		2,624		2.40		1522.1	690.3
29		13.9		1,325		1.67		2,707		2.48		1570.5	712.3
30	0.658	12.9	66.5	1,304	0.0859	1.68	122	2,392.5	3.30	2.35	85.0	1666.9	756.0
31		12.7		1,287		1.66		2,362.0		2.32		1645.6	746.3
Total	4.87	244.04	422.50	23,134.47	0.66	34.89	621.60	37,159.87	29.75	42.45	396.00	25,524.67	11,575.81
Sample Events	9	31	9	31	9	30	9	31	9	31	9	31	31
Daily Average	0.541	7.9	46.9	746	0.074	1.16	69.1	1,199	3.31	1.37	44	823	373

Notes:
(X mg/L) * (1 kg/10^6 mg) * (2.205 lbs/kg) * (3.785 L/gal) * (10^6 gal/Mgal) * (Y Mgal/day) = (X) * (Y) * (8.345) lbs/day
(X lbs/day) * (1 kg/2.205 lbs) = (X) / (2.205) kg/day
verified by Brian Johnson, 11/14/17

PTM Effluent at Lined Storage Pond **Month: Oct-17**
CENTRAL TREATMENT PLANT

DATE	LEAD mg/L	ZINC mg/L	CADMIUM mg/L	pH s.u. CTP Lab	TSS mg/L
10/05/17	0.0031	8.92	1.22	7.01	0.2
10/19/17	0.0026	8.84	1.17	6.76	0.2

RINSATE AND TRIP BLANKS **Month: Oct-17**
CENTRAL TREATMENT PLANT

Rinsate and Trip Blank samples will be taken approximately every 20 QC events, or one each per month.

LOCATION Rinsate & Trip Blank	DATE	SAMPLE	LEAD mg/L	ZINC mg/L	CADMIUM mg/L
Kellogg tunnel Discharge		RB-10-04-17	<0.008	<0.010	<0.002
Trip Blank (D.I.water)		TB-10-04-17	<0.008	<0.010	<0.002

verified by Brian Johnson, 11/14/17

Bunker Hill Central Treatment Plant

Daily log October 2017

				AERATION BASIN					CLARIFIER						DISCHARGE 006								RECYCLE SG		LIME SLURRY			SLUDGE PUMP		POND PUMP		SLUDGE GUN TEST		LINED POND
		INFLUENT KT			a.m.		p.m.		a.m.		p.m.				a.m.		p.m.		DO	1/wk							Injection Valve							ESTIMATED
DATE	Operators	GPM	pH	SET	pH1	grab	pH1	grab	pH2	grab	pH2	grab	TURB	TEMP	pH3	grab	pH3	grab	PPM	TEMP	TURB	FLOW	SG	GPM	SG	%solid	Closed/Open	pump #	min	ON	OFF	10' Out	20' Out	Elevation (mg)
10/1	SB			8.4	8.4	8.5	8.4	8.5	7.8	7.9	7.8	7.9	2.89	55	7.7	7.3	7.6	7.4			2.98	2.46	1.051	400	1.065	10.1	187/35	3	120					2269.0 (1.0mg)
10/2	GF,SB	1775	3.10	8.5	8.5	8.5	8.6	8.6	7.9	8.0	8.0	7.9	2.00	54	7.6	7.2	7.6	7.2			2.09	2.42	1.051	400	1.066	10.2	180/35	3	120	#3-04:40	13:00			2269.0
10/3	GF,SB,GC			8.5	8.4	8.4	8.4	8.4	7.8	7.8	7.8	7.9	1.88	53	7.8	7.2	7.6	7.3			1.83	2.67	1.051	400	1.066	10.2	197/35	3	120	#3-05:50	12:00			2268.8 (.80mg)
10/4	GF,SB,GC			8.4	8.4	8.4	8.4	8.4	7.8	7.8	7.9	8.1	1.43	53	7.6	7.2	7.5	7.2	9.9	7.0c	1.82	2.57	1.050	400	1.064	10.0	189/35	3	120					2268.5 (.75mg)
10/5	GF,SB,GC	1750	3.10	8.4	8.5	8.5	8.4	8.3	7.8	7.8	7.8	7.9	1.80	56	7.7	7.2	7.7	7.3			1.71	2.39	1.046	400	1.063	9.8	190/35	3	120					2268.5
10/6	GF,GC			8.4	8.4	8.4	8.5	8.4	7.8	7.9	7.7	7.8	1.55	54	7.8	7.0	7.8	7.1			1.63	2.42	1.050	400	1.064	10.0	141/35	3	120					2268.5
10/7	GC			8.4	8.4	8.4	8.4	8.4	7.7	7.8	7.6	7.7	1.74	54	7.6	7.2	7.7	7.2			1.61	2.44	1.054	400	1.065	10.1	159/35	3	120					2268.5
10/8	SB			8.4	8.4	8.4	8.7	8.7	7.9	7.8	7.7	7.8	1.58	52	7.7	7.2	7.7	7.2			1.55	2.43	1.047	400	1.066	10.2	154/35	3	120	#3-04:00	6:08			<2268.5
10/9	GF,SB,GC	140	2.55	8.4	9.1	9.0	N/A	N/A	7.9	7.7	N/A	N/A	2.50	48	7.4	7.7	N/A	N/A			1.63	0.79	1.047	400	1.066	10.2	385/10	3	140					<2268.5
10/10	GF,SB	130		8.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	45	N/A	N/A	N/A	N/A			N/A	0.00	N/A	400	N/A	N/A	N/A	3	0.0					2268.5 (.75mg)
10/11	GF,SB,GC	130		8.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	400	N/A	N/A	N/A	3	0.0					2269.0 (1.0mg)
10/12	GF,SB,GC	130	2.77	8.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	50	N/A	N/A	N/A	N/A			N/A	0.00	N/A	400	N/A	N/A	N/A	3	0.0					2269.0 (1.0mg)
10/13	GC	130		8.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	45	N/A	N/A	N/A	N/A			N/A	0.00	N/A	400	N/A	N/A	N/A	3	0.0					2269.5 (1.25mg)
10/14	GC			8.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	50	N/A	N/A	N/A	N/A			N/A	0.00	N/A	400	N/A	N/A	N/A	3	0.0					2269.7 (1.38mg)
10/15	SB			8.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	45	N/A	N/A	N/A	N/A			N/A	0.00	N/A	400	N/A	N/A	N/A	3	0.0					2270.0 (1.50mg)
10/16	SB			8.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	42	N/A	N/A	N/A	N/A			N/A	0.00	N/A	400	N/A	N/A	N/A	3	0.0					2270.5 (1.87mg)
10/17	GF,SB,GC	130		8.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			N/A	0.00	N/A	400	N/A	N/A	N/A	3	0.0					2270.8 (2.00mg)
10/18	GF,SB	139		8.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	400	N/A	N/A	N/A	3	0.0					2271.0 (2.25mg)
10/19	GF,SB	139	3.06	8.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			N/A	0.00	N/A	400	N/A	N/A	N/A	3	0.0					2271.8 (2.75mg)
10/20	GF,SB	140		**8.5**	N/A	N/A	8.5	8.5	N/A	N/A	6.8	7.1	2.00	43	N/A	N/A	7.1	7.2			N/A	0.00	1.013	400	1.070	10.8	280/15	3	0.0	#3-10:00				2272.0 (3.0 mg)
10/21	SB			8.5	8.3	8.3	8.5	8.5	7.9	7.8	7.9	8.0	2.28	48	7.6	7.0	7.7	7.0			2.02	2.00	1.020	400	1.070	10.8	398/13	3	0.0		6:00			2270.0 (1.5mg)
10/22	SB			8.5	8.5	8.5	8.6	8.6	7.9	7.9	7.9	7.9	1.53	49	7.5	7.1	7.5	7.0			1.34	0.96	1.028	400	1.070	10.8	307/25	3	0.0					2270.0
10/23	GF,SB	667	2.35	8.5	8.5	8.4	8.7	8.6	8.0	8.0	8.1	8.1	0.97	42	7.3	7.0	7.5	7.2			1.05	0.89	1.033	400	1.068	10.5	280/20	3	60	#3-08:25	13:25			2270.0
10/24	GF,SB,GC			8.5	8.4	8.4	8.4	8.4	8.2	7.7	8.2	7.9	0.61	36	7.5	7.0	7.4	7.2			0.79	1.23	1.029	400	1.067	10.4	332/20	3	30	#3-05:45	12:00			2269.5 (1.25mg)
10/25	GF,SB,GC			8.4	8.4	8.4	8.2	8.2	8.1	8.1	8.1	8.0	0.60	45	7.4	7.0	7.4	7.1	10.51	6.3	0.54	2.30	1.059	400	1.069	10.7	146/35	3	150					2269.0 (1.0mg)
10/26	GF,SB,GC	1812	2.98	8.4	8.4	8.4	8.4	8.4	7.9	7.8	8.1	8.0	1.01	51	7.8	7.0	7.8	7.1			0.66	2.43	1.057	400	1.067	10.4	116/35	3	150					2269.0
10/27	GC			8.4	8.4	8.5	8.5	8.5	7.9	8.0	8.0	7.8	1.01	51	7.9	7.4	7.8	7.2			0.86	2.50	1.058	400	1.066	10.2	120/35	3	150					2269.0
10/28	GC			8.4	8.4	8.4	8.4	8.4	8.0	7.9	8.1	7.9	0.86	51	8.0	7.5	8.0	7.3			0.88	2.40	1.054	400	1.068	10.5	157/35	3	120					2269.0
10/29	SB			8.4	8.4	8.5	8.4	8.4	8.1	8.0	8.1	8.1	1.21	50	8.0	7.3	8.0	8.2			1.10	2.48	1.053	400	1.069	10.7	159/35	3	120					2269.0
10/30	GF,SB	1736	3.14	8.4	8.4	8.5	8.5	8.6	8.2	8.1	8.1	8.0	0.96	52	7.9	7.0	7.9	7.1			0.90	2.35	1.051	400	1.070	10.8	163/35	3	130					2269.0
10/31	GF,SB,GC			8.4	8.4	8.5			8.1	7.9			0.87	50	7.8	7.5					0.72	2.32	1.048	400	1.066	10.2	151/35	3	120					2269.5(1.25mg)
																			1/wk	1/wk														
Averages:				8.42	8.45	8.45	8.47	8.46	7.92	7.88	7.87	7.88	**1.49**	48.9	7.68	7.20	7.64	7.23	PPM	*c	1.39	1.37	1.05						69					
																													2130					

Notes:

10-02-17 04:40-13:00 Diverted KT flow of 1800 gpm to the lined storage pond. Activated the #3 lined storage pond pump to lower the lined storage pond level. pH set point 8.50 during pumping event. 1,278,000 Gallons

10-03-17 05:50-12:00 Diverted KT flow of 1775gpm to the lined storage pond. Activated the #3 lined storage pond pump to lower the lined storage pond level. pH set point 8.50 during pumping event.

10-08-17 10:30 Mine pool pump shut off flow decreased from 1740 gpm to 700 gpm. Ph set point increased from 8.4 to 8.5.

10-08-17 23:00 Mine discharge decreased to approximately 175 gpm.

10-09-17 04:00 Lined storage pond pump #3 activated in an attempt to utilize the 5000 gallons of lime slurry in the holding tank.

10-09-17 14:00 Placed the CTP in shutdown mode, diverted the KT flow of approximately 150 gpm to the lined storage pond. KT flow will remain diverted to the lined pond until further notice.

10-20-17 11:00 The Bunker Hill Mine was notified that water can be discharge from the KT. 10:00 #3 lined storage pond pump was activated, CTP is not in full operations.

10-21-17 06:00 KT flow of approximately 650 gpm influent to the CTP through the direct feed line.

10-23-17 08:25-13:00 Diverted KT flow of 667 gpm to the lined storage pond. Activated the #3 lined storage pond pump to lower the lined storage pond level. pH set point 8.50 during pumping event.

10-23-17 14:30 KT flow remained at a low flow of 667 gpm. The mine pool pump was not activated prior to 14:30.

10-24-17 05:45-12:00 Diverted KT flow of 667 gpm to the lined storage pond. Activated the #3 lined storage pond pump to lower the lined storage pond level. pH set point 8.50 during pumping event.

10-24-17 12:40 KT flow increased from 667 gpm to approximately 1700 gpm. The mine pool pump was activated. pH set point was reduced to 8.40 from 8.50.

10-25-17 Performed quarterly direct feed line cleaning event. Periodic adjustments of KT flow to the CTP were performed during the pigging event.

10-30-17 11:30 KT flow decreased from 1735 gpm to approximately 670 gpm. pH set point was increased from 8.40 to 8.50.

10-30-17 13:30 KT flow increased from 670 gpm to approximately 1735 gpm. pH set point decreased from 8.50 to 8.40.

CENTRAL TREATMENT PLANT **MISCELLANEOUS FLOWS**

Month : **Oct-17**

Date	**KT Flow Meter Reading**
9/30/2017	0
10/31/2017	43,469,300
Total	43,469,300

Date	**006 Flow Meter Reading**
9/30/2017	0
10/31/2017	42,450,200
Total	42,450,200

Sweeny Pump Station Reading

Date	#1 Pump	620 gpm	#2 Pump	500 gpm
9/30/2017	170.0	Hours	785.0	Hours
10/31/2017	170.0	Hours	785.0	Hours
Total Hours	0.0	Hours	0.0	Hours
Total Flow for 004/Sweeny For The Month =			0	Gallons

Date	**Lined Storage Pond Water Level**			
9/30/2017	1,000,000	gal	Elev. =	2269.0
10/31/2017	1,250,000	gal	Elev. =	2269.5

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Lined Storage Pond Influent Flows

PTM Discharge Flow

Date	Flow (gpm)
10/05/17	7.0
10/19/17	7.0

Old Mine Line Discharge Flow

Date	Flow (gpm)
NA	NA

2017-May 03 to 2018-May 02 BHCTP LIME USAGE AFW

	Silo A						Silo B						Total	
Month	Initial Level	Final Level	Diff. (ft)	Diff. (tons)	Tons Added	Net Tons	Initial Level	Final Level	Diff. (ft)	Diff. (tons)	Tons Added	Net Tons	Net Tons	Tons/Day
May 3-May 31	16.00	16.00	0.0	0.0	0.00	0.0	14.00	7.30	6.7	36.1	183.79	219.9	219.9	7.58
June 1-June 30	16.00	11.40	4.6	24.8	83.42	108.2	7.30	13.2	-5.9	-31.8	67.10	35.3	143.5	4.78
July 1-July 31	11.40	11.00	0.4	2.2	0.00	2.2	13.20	8.50	4.7	25.3	114.10	139.4	141.6	4.57
August 1-August 31	11.00	15.80	-4.8	-25.9	40.50	14.6	8.50	16.3	-7.8	-42.0	115.00	73.0	87.6	2.83
Sept. 1 - Sept 30	15.80	11.30	4.5	24.3	76.50	100.8	16.30	16.30	0.0	0.0	0.00	0.0	100.8	3.36
Oct. 1 - Oct. 31	11.30	14.00	-2.7	-14.6	77.00	62.4	16.30	16.30	0.0	0.0	0.00	0.0	62.4	2.01
Nov. 1 - Nov. 30	14.00	14.00	0.0	0.0			16.30	16.30	0.0	0.0				
				Silo A	**277.42**					**Silo B**	**479.99**		755.8	
						Tdl Tons Purchased		**757.41**					**Average**	**4.62**

NOTES:
May 3, 2017 A= 16.0 B = 14.0 AFW Beginning Levels
01-25-17 Placed slaker/silo B into service, slaker/silo A in six month standby mode.
04-20-17 Placed 4.9 ton into silo A and 31.1 ton into silo B, fill in preparation for contract changeover.
05-23-17 Received the initial Pete Lien & Sons lime delivery of 39.20 tons - Silo B
05-30-17 Received Pete Lien & Sons lime delivery of 37.50 tons - Silo B
06-01-17 Received Pete Lien & Sons lime delivery of 39.0 tons - Silo B
06-04-17 Removed Lime System B (Slaker B) from service and placed Lime System A into service. Lime System B in fail mode (lime feed auger has failed).
06-04-17 12:30 Operator measured the void space in Silo B at 9.0'. The silo B level indicator display reading at this time was 10.7'.
06-06-17 28.1 Tons placed into Silo B, **11.3 Tons placed into Silo A - Silo B Cone/Stack issues prevented loading entire truck into Silo B (15.1 ft)**
06-07-17 11:00 Placed slaker/silo A into service, placed slaker/silo B into standby mode
06-13-17 Drained and cleaned slaker B. 06-14-17 Drained and cleaned slaker A.
06-28-17 08:00 Slaker A removed from service, slaker B placed into service. Operators replaced the #2 lime loop pressure valve rubber body and slaker A drive shaft packing.
07-10-17 06:30 Slaker B removed from service due to a lime feed issue. Slaker A placed into service. Operators will investigate when time allows.
08-09-17 36 Tons placed into Silo B, 2 Tons placed into Silo A
08-22-17 Slaker B (Silo B) removed from service, Slake A (Silo A) placed into service - Six Month Rotation- Lime loop #2 off, Lime loop #1 on -Six Month Rotation-

Lime Daily Use - 7 Days

	Silo A						**Silo B**						Total	
	Initial Level	Final Level	Diff. (ft)	Diff. (tons)	Tons Added	Net Tons	Initial Level	Final Level	Diff. (ft)	Diff. (tons)	Tons Added	Net Tons	Net Tons	Tons/Day
10/30-11/06	14.30	14.30	0.0	0.0	38.50	38.5	16.30	16.30	0.0	0.0	0.00	0.0	38.5	5.50

Lime Silo A Depth Readings

Date	**Prior**	**After**	**Tons Received**		**Tons/ft**
6/6/2017	14.6	16.7	11.30		5.38
6/15/2017	9.5	14.6	36.02		7.06
6/22/2017	10.1	15.2	36.10		7.08
8/9/2017	11.0	11.2	2.00	Estimated	10.00
8/28/2017	10.1	16.0	38.50		6.53
9/14/2017	8.7	14.6	38.00		6.44
9/25/2017	8.0	13.5	38.50		7.00
10/2/2017	10.8	16.3	38.50		7.00
10/27/2017	9.5	15.5	38.50		6.42
1 Month Average:					**6.71**

Lime Silo B Depth Readings

Date	**Prior**	**After**	**Tons Received**		**Tons/ft**
5/22/2017	7.7	11.4	39.2		10.59
5/30/2017	3.5	7.5	37.5		9.38
6/1/2017	6.5	13.3	39.0		5.74
6/5/2017	10.8	15.1	28.1		6.53
7/10/2017	6.6	11.2	39.6		8.61
7/12/2017	10.5	17.0	35.0		5.38
7/31/2017	4.8	8.5	39.5		10.68
8/7/2017	6.4	11.3	39.5		8.06
8/9/2017	10.6	17.2	37.0	Estimated	5.61
8/21/2017	10.9	16.5	38.5		6.88

LIME DEMAND TRACKING

Year	Month	Lime (tons)	KT flow (mg)	Lime Demand (g/L)	
2006	Jan.	70.2	56.0	0.30	
	Feb.	69.9	51.2	0.33	
	March	96.3	56.3	0.41	
	April	107.5	72.0	0.36	
	May	235.4	72.0	0.78	peak
	June	114.6	68.3	0.40	
	July	100.4	64.0	0.38	
	Aug.	118.2	64.1	0.44	
	Sept.	38.4	54.5	0.17	
	Oct.	69.5	57.6	0.29	
	Nov.	71.3	55.2	0.31	
	Dec.	78.2	60.5	0.31	
2007	Jan.	66.0	56.3	0.28	
	Feb.	51.8	50.5	0.25	
	March	81.7	65.4	0.30	
	April	127.9	66.6	0.46	
	May	154.0	63.2	0.58	peak
	June	94.1	57.9	0.39	
	July	107.0	58.3	0.44	
	Aug.	75.8	55.3	0.33	
	Sept.	77.2	50.5	0.37	
	Oct.	62.3	50.1	0.30	
	Nov.	56.9	50.8	0.27	
	Dec.	28.1	52.0	0.13	
2008	Jan.	60.7	53.4	0.27	
	Feb.	50.2	49.3	0.24	
	March	58.0	54.6	0.25	
	April	78.3	61.7	0.30	
	May	629.3	86.7	1.74	peak
	June	388.1	82.6	1.13	
	July	155.6	66.3	0.56	
	Aug.	129.5	65.2	0.48	
	Sept.	97.2	61.1	0.38	
	Oct.	76.4	58.7	0.31	
	Nov.	64.9	52.0	0.30	
	Dec.	73.0	55.7	0.31	
2009	Jan.	70.3	50.9	0.33	
	Feb.	60.3	48.2	0.30	
	March	62.1	61.7	0.24	
	April	88.0	63.1	0.33	
	May	180.9	70.2	0.62	peak
	June	146.3	64.6	0.54	
	July	104.4	61.6	0.41	
	Aug.	94.8	56.4	0.40	
	Sept.	89.2	57.0	0.38	
	Oct.	69.4	55.8	0.30	
	Nov.	70.9	55.0	0.31	
	Dec.	47.4	54.5	0.21	
2010	Jan.	66.7	55.5	0.29	
	Feb.	51.5	50.8	0.24	
	March	49.5	54.7	0.22	
	April	50.0	56.3	0.21	
	May	58.7	58.8	0.24	
	June	58.8	56.8	0.25	
	July	79.7	56.7	0.34	peak
	Aug.	54.7	56.2	0.23	
	Sept.	63.8	54.1	0.28	
	Oct.	54.6	55.4	0.24	
	Nov.	54.1	55.8	0.23	
	Dec.	64.5	54.6	0.28	
2011	Jan.	77.1	61.7	0.30	
	Feb.	69.8	54.6	0.31	
	March	94.7	61.4	0.37	
	April	119.6	65.6	0.44	
	May	433.0	84.4	1.23	peak
	June	328.4	80.0	0.98	
	July	159.9	79.3	0.48	
	Aug.	120.8	70.3	0.41	
	Sept.	92.4	60.4	0.37	
	Oct.	97.8	62.4	0.38	
	Nov.	66.8	58.4	0.27	
	Dec.	65.2	58.6	0.27	
2012	Jan.	74.9	58.4	0.31	
	Feb.	56.8	57.7	0.24	

LIME DEMAND TRACKING

Year	Month	Lime (tons)	KT flow (mg)	Lime Demand (g/L)	
	March	85.6	67.2	0.31	
	April	194.8	81.2	0.57	
	May	261.6	86.8	0.72	peak
	June	179.9	83.4	0.52	
	July	140.8	74.3	0.45	
	Aug.	118.0	68.9	0.41	
	Sept.	95.6	62.2	0.37	
	Oct.	89.0	60.0	0.36	
	Nov.	73.3	57.2	0.31	
	Dec.	74.8	61.8	0.29	
2013	Jan.	57.2	61.9	0.22	
	Feb.	64.5	59.4	0.26	
	March	71.7	66.2	0.26	
	April	96.9	69.6	0.33	
	May	126.2	71.5	0.42	peak
	June	94.1	64.6	0.35	
	July	91.2	62.8	0.35	
	Aug.	89.2	58.4	0.37	
	Sept.	65.2	58.0	0.27	
	Oct.	59.3	58.3	0.24	
	Nov.	50.9	56.2	0.22	
	Dec.	49.9	56.9	0.21	
2014	Jan.	38.7	57.4	0.16	
	Feb.	35.8	54.6	0.16	
	March	73.1	65.3	0.27	
	April	101.1	65.6	0.37	
	May	208.3	80.6	0.62	peak
	June	127.4	65.6	0.47	
	July	87.5	63.4	0.33	
	Aug.	81.1	61.5	0.32	
	Sept.	63.7	56.3	0.27	
	Oct.	53.1	60.6	0.21	
	Nov.	62.8	55.0	0.27	
	Dec.	54.6	59.7	0.22	
2015	Jan.	51.7	58.4	0.21	
	Feb.	61.0	59.7	0.24	
	March	83.1	64.4	0.31	
	April	94.8	63.0	0.36	peak
	May	73.3	62.0	0.28	
	June	69.7	65.3	0.26	
	July	83.6	55.6	0.36	
	Aug.	58.4	55.3	0.25	
	Sept.	55.3	53.9	0.25	
	Oct.	56.8	52.0	0.26	
	Nov.	46.3	49.8	0.22	
	Dec.	43.7	51.5	0.20	
2016	Jan.	24.2	52.2	0.11	
	Feb.	33.4	53.6	0.15	
	March	66.0	64.0	0.25	
	April	86.1	63.3	0.33	
	May	96.9	58.1	0.40	peak
	June	69.9	53.1	0.32	
	July	68.2	56.5	0.29	
	Aug.	53.7	53.2	0.24	
	Sept.	53.6	49.8	0.26	
	Oct.	49.8	52.4	0.23	
	Nov.	48.7	53.8	0.22	
	Dec.	48.3	52.0	0.22	
2017	Jan.	51.7	49.3	0.25	
	Feb.	46.9	53.7	0.21	
	March	140.0	59.0	0.57	
	April	174.5	61.9	0.68	
	May	246.6	84.2	0.70	peak
	June	143.5	73.1	0.47	
	July	141.6	69.4	0.49	
	Aug.	87.6	58.5	0.36	
	Sept.	100.8	67.4	0.36	
	Oct.	60.8	43.5	0.34	

KELLOGG TUNNEL ZINC DATA

			Concentration (mg/L)											
Month	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Jan.		86	81	79	63	70	61	72	57	68	41	46	50	53
Feb.		86	91	96	55	72	57	95	58	68	41	68	52	50
March		94	116	86	65	68	53	86	58	69	58	81	63	124
April		98	121	140	85	80	50	137	176	86	107	92	115	238
May		105	231	179	318	136	57	377	215	150	177	87	138	206
June		107	182	118	271	143	68	347	164	106	131	78	108	145
July		90	144	111	198	117	75	181	136	87	87	75	81	97
Aug.		87	112	92	132	94	79	130	110	86	76	66	76	98
Sept.		84	107	80	107	76	81	132	107	75	66	63	68	75
Oct.	59	81	100	88	99	75	70	86	70	67	63	54	52	53
Nov.	66	79	88	88	104	63	57	95	71	70	55	44	52	
Dec.	67	62	78	65	76	59	61	88	69	54	49	55	50	
average	**64**	**88**	**121**	**102**	**131**	**88**	**64**	**152**	**108**	**82**	**79**	**67**	**75**	**114**
lime usage (tons/day)		**2.59**	**3.23**	**2.76**	**4.78**	**3.24**	**2.16**	**4.31**	**3.93**	**2.46**	**2.70**	**1.99**	**1.93**	
Zinc Conc. Increase/Decrease			**37%**	**-16%**	**29%**	**-33%**	**-27%**	**138%**	**-29%**	**-24%**	**-4%**	**-15%**	**12%**	
Lime Usage Increase/Decrease			**25%**	**-15%**	**73%**	**-32%**	**-33%**	**100%**	**-9%**	**-37%**	**10%**	**-26%**	**-3%**	

KELLOGG TUNNEL ANNUAL DISCHARGE FLOWS 2000-2009

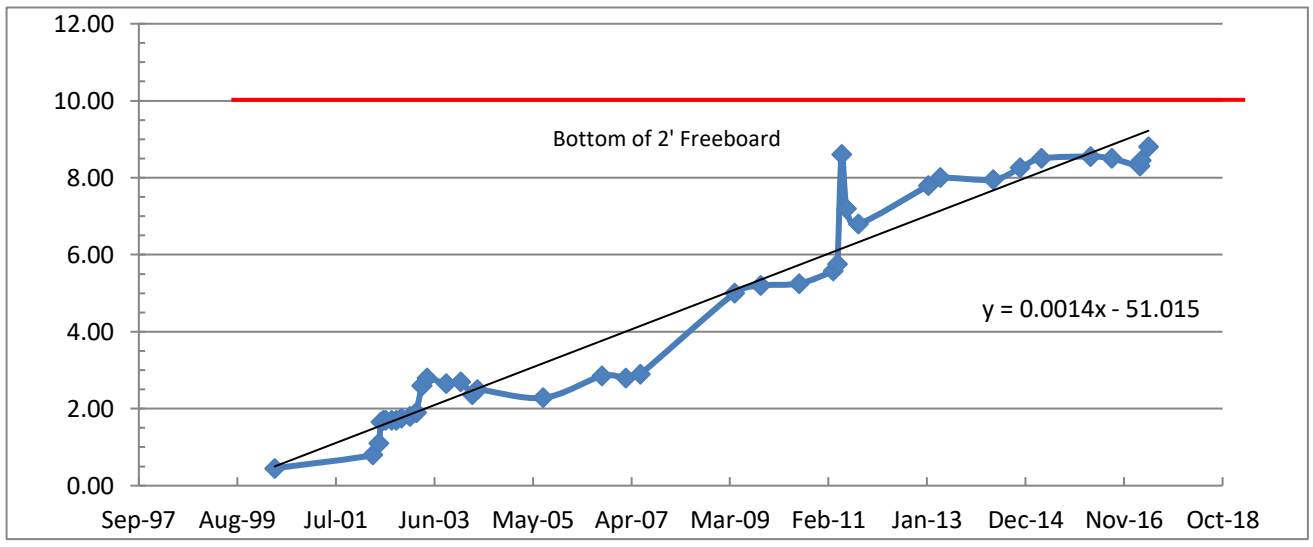
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Jan.	61,000,000	61,677,510	54,606,100	53,066,890	52,223,080	53,150,000	56,050,900	56,281,000	53,465,820	50,936,960
Feb.	57,600,000	45,584,000	52,840,000	46,493,470	48,306,920	49,860,000	51,188,000	50,511,300	49,282,209	48,146,111
March	60,730,000	57,740,360	50,452,060	60,162,290	59,852,720	58,073,000	56,332,830	65,443,650	54,578,130	61,712,540
April	68,680,000	54,846,000	65,583,230	63,335,350	50,715,310	53,775,350	72,039,280	66,636,500	61,690,530	63,055,350
May	**97,719,900**	57,501,901	76,082,410	63,335,350	53,245,000	54,181,650	72,027,000	63,203,308	86,680,760	70,233,580
June	69,800,000	55,835,590	67,299,960	59,532,434	50,451,170	51,750,000	68,385,600	57,981,410	82,622,590	64,623,180
July	63,698,850	53,652,330	64,820,120	66,252,746	56,538,980	55,255,000	64,054,000	58,282,900	66,324,500	61,535,000
Aug.	66,707,120	45,289,000	58,212,940	62,074,750	52,002,140	49,970,000	64,621,000	55,335,900	65,168,620	56,446,670
Sept.	55,797,530	50,276,020	60,140,460	43,789,000	49,208,020	49,987,000	54,515,270	50,471,870	61,074,020	57,006,430
Oct.	60,424,720	50,660,840	54,485,871	52,869,290	59,601,690	52,807,000	57,610,030	50,086,330	58,666,300	55,830,000
Nov.	53,408,660	50,660,840	51,072,259	47,600,000	51,948,000	50,722,600	55,191,700	50,779,040	52,041,780	54,956,800
Dec.	56,414,870	53,464,780	56,034,000	56,413,080	56,770,000	54,904,400	60,486,900	53,716,210	55,727,260	54,542,700
Totals	771,981,650	637,189,171	711,629,410	674,924,650	640,863,030	634,436,000	732,502,510	678,729,418	747,322,519	699,025,321

KELLOGG TUNNEL ANNUAL DISCHARGE FLOWS 2010-2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Jan.	55,503,180	61,797,170	58,434,610	**61,855,400**	57,478,450	58,440,540	52,196,750	49,352,650		
Feb.	50,819,910	54,556,227	57,763,170	59,383,290	54,607,950	**59,767,470**	53,694,400	53,675,440		
March	54,691,420	61,373,630	**67,236,650**	66,264,780	65,396,350	64,468,230	63,967,920	58,977,410		
April	56,255,340	65,687,340	**81,233,630**	69,619,100	65,618,770	63,056,840	63,323,620	61,947,620		
May	58,825,640	84,365,390	**86,826,340**	71,496,380	80,598,590	61,898,200	58,147,240	84,208,690		
June	56,770,200	79,985,540	**83,440,990**	64,663,900	65,623,330	56,368,540	53,149,810	73,144,700		
July	56,727,510	**79,346,330**	74,315,690	62,844,790	63,425,030	55,655,000	56,521,710	69,470,550		
Aug.	56,239,370	**70,377,570**	68,986,900	58,459,380	61,486,270	55,316,100	53,293,430	58,550,600		
Sept.	54,109,980	60,404,280	**62,270,300**	58,097,500	56,279,590	53,890,000	49,796,420	67,447,510		
Oct.	55,480,200	**62,403,480**	59,991,850	58,325,780	60,659,850	52,082,800	52,417,120	43,469,300		
Nov.	54,856,880	**58,430,700**	57,184,220	56,215,000	55,065,100	49,812,540	53,815,710			
Dec.	54,607,330	58,617,700	**61,750,390**	56,932,530	59,770,540	51,521,900	52,063,110			
Totals	664,886,960	797,345,357	**819,434,740**	**744,157,830**	**746,009,820**	**682,278,160**	**662,387,240**	**620,244,470**	**0**	**0**

Yellow indicates record monthly flow as well as record annual flow

Bunker Hill Sludge Pond
Sludge Staff Gauge Reading Summary



Date	Sludge Level (feet)	Estimated Sludge Elevation	Estimated Remaining Height to Road (feet)
05/19/00	0.45		
04/16/02	0.80		
05/28/02	1.10		
06/13/02	1.65		
07/01/02	1.70		
07/16/02	1.70		
08/27/02	1.70		
10/01/02	1.70		
11/06/02	1.75		
01/06/03	1.80		
02/19/03	1.90		
02/19/03	1.90		
03/31/03	2.60		
04/01/03	2.60		
05/07/03	2.80		
09/19/03	2.65		
01/01/04	2.70		
03/22/04	2.36		
04/29/04	2.50	2311	11.0
08/09/05	2.28	2310.8	11.2
09/30/06	2.85	2311.4	10.7
03/20/07	2.80	2311.3	10.7
6/30/2007	2.90	2311.4	10.6
4/30/2009	5.00	2313.5	8.50
10/31/2009	5.20	2313.7	8.30
7/31/2010	5.25	2313.8	8.25
3/31/2011	5.58	2314.1	7.92
4/30/2011	5.75	2314.3	7.75
5/30/2011	8.60	2317.1	4.90
7/5/2011	7.20	2315.7	6.30
9/26/2011	6.80	2315.3	6.70
2/4/2013	7.80	2316.3	5.70
4/30/2013	8.00	2316.5	5.50
5/12/2014	7.95	2316.5	5.55
11/20/2014	8.26	2316.8	5.24
4/20/2015	8.50	2317.0	5.00
4/1/2016	8.55	2317.1	4.95
9/1/2016	8.50	2317.0	5.00
3/20/2017	8.30	2316.8	5.20
3/28/2017	8.45	2317.0	5.05
5/18/2017	8.80	2317.3	4.70
7/31/2017	8.75	2317.3	4.75

6282	**8.30**	**Total Change, Days and Feet**
Note 3	0.48	Average Rise Per Year (Includes Lined Pond Cleanout), feet
	4.75	Estimated average remaining total height to perimeter road, feet
	2.0	Assumed desired end-of-life freeboard, feet
	2.8	Estimated available storage height, feet
	5.7	**Estimated Remaining Life (years)**
	1/28/2023	

Notes:

1) Pond perimeter road centerline elevation = 2322.0 feet from CIA as-builts Drawing C-28

CTP Mine Water Line Open Channel Inspection Form

Note: This form should be utilized weekly during the regular channel cleanout.
Results will be include with the Daily Quality Control Report and monthly DMR.

Date: October 05, 2017 Inspected By: Gary Coast, Steve Brunner

Item Inspected	Condition	Comments	
Channel Sections and Joints	**Good** / Poor	Check for cracks	Ok
Channel Inlet Connection @ KT	**Good** / Poor	Check for cracks	Ok
Channel Outlet/Pipeline Inlet	**Good** / Poor	Check for cracks	Ok
Channel Bottom (during low flows)	**Good** / Poor	Concrete walls show signs of pitting	Ok
Bottom Joints (during low flows)	**Good** / Poor		Ok
Trash Rack Assembly Rail Units	**Good** / Poor	Check for corrosion and bolt tightness	Ok
Trash Racks	**Good** / Poor	Wood debris & grass clippings were removed	
Parshall Flume	**Good** / Poor	Check fiberglass and joint connections	Ok
		Flume staff gauge needs replaced	

General Comments:

The Kellogg Tunnel flow at this time is 2.52 mgd (1750 gpm), pH at this time is 3.10

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

Small amount of wood debris was removed from the mine discharge flume during this cleaning event.

No discussions occurred with any mine personnel.

CTP Mine Water Line Open Channel Inspection Form

Note: This form should be utilized weekly during the regular channel cleanout.
Results will be include with the Daily Quality Control Report and monthly DMR.

Date: October 12, 2017 Inspected By: Gary Coast, Steve Brunner

Item Inspected	Condition	Comments
Channel Sections and Joints	**Good** / Poor	Check for cracks Ok
Channel Inlet Connection @ KT	**Good** / Poor	Check for cracks Ok
Channel Outlet/Pipeline Inlet	**Good** / Poor	Check for cracks Ok
Channel Bottom (during low flows)	**Good** / Poor	Concrete walls show signs of pitting/corrosion
Bottom Joints (during low flows)	**Good** / Poor	Ok
Trash Rack Assembly Rail Units	**Good** / Poor	Check for corrosion and bolt tightness Ok
Trash Racks	**Good** / Poor	Wood debris was removed from both racks
Parshall Flume	**Good** / Poor	Check fiberglass and joint connections Ok Flume staff gauge needs replaced

General Comments:

The Kellogg Tunnel flow at this time is 0.87 mgd (130 gpm), pH at this time is 2.77.

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

Operators removed approximately 25 gallons of scale and gravel from the KT flume during this cleaning event. Operators utilized this low low flow event to perform a complete flume cleaning.

Photos of the reported concrete pitting of the lower sections of the concrete walls were taken.

CTP Mine Water Line Open Channel Inspection Form

Note: This form should be utilized weekly during the regular channel cleanout.
Results will be include with the Daily Quality Control Report and monthly DMR.

Date: October 19, 2017 Inspected By: Gary Fulton, Steve Brunner

Item Inspected	Condition	Comments
Channel Sections and Joints	**Good** / Poor	Check for cracks Ok
Channel Inlet Connection @ KT	**Good** / Poor	Check for cracks Ok
Channel Outlet/Pipeline Inlet	**Good** / Poor	Check for cracks Ok
Channel Bottom (during low flows)	**Good** / Poor	Concrete walls show signs of pitting/corrosion
Bottom Joints (during low flows)	**Good** / Poor	Ok
Trash Rack Assembly Rail Units	**Good** / Poor	Check for corrosion and bolt tightness Ok
Trash Racks	**Good** / Poor	Wood debris was removed from both racks
Parshall Flume	**Good** / Poor	Check fiberglass and joint connections Ok Flume staff gauge needs replaced

General Comments:

The Kellogg Tunnel flow at this time is 0.20 mgd (139 gpm), pH at this time is 3.06.

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

Operators removed leaves from the upper trash rack during this cleaning event.

CTP Mine Water Line Open Channel Inspection Form

Note: This form should be utilized weekly during the regular channel cleanout.
Results will be include with the Daily Quality Control Report and monthly DMR.

Date: October 26, 2017 Inspected By: Gary Coast, Steve Brunner

Item Inspected	Condition	Comments
Channel Sections and Joints	**Good** / Poor	Check for cracks Ok
Channel Inlet Connection @ KT	**Good** / Poor	Check for cracks Ok
Channel Outlet/Pipeline Inlet	**Good** / Poor	Check for cracks Ok
Channel Bottom (during low flows)	**Good** / Poor	Concrete walls show signs of pitting/corrosion
Bottom Joints (during low flows)	**Good** / Poor	Ok
Trash Rack Assembly Rail Units	**Good** / Poor	Check for corrosion and bolt tightness Ok
Trash Racks	**Good** / Poor	No debris ok
Parshall Flume	**Good** / Poor	Check fiberglass and joint connections Ok Flume staff gauge needs replaced

General Comments:

The Kellogg Tunnel flow at this time is 2.60 mgd (1812 gpm), pH at this time is 2.98.

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

No debris was removed from the mine discharge flume during this cleaning event.

No discussions occurred with any of the mine personnel.