APPENDIX E:

QUARRY PIT WATER (POND 4A)

QUARTERLY WATER SAMPLE RESULTS

Memorandum

To: Greg Knapp, Lehigh Hanson
Cc:

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Date: August 29, 2013
Subject: Permanente Quarry COA 76 –Quarterly Pit (Pond 4A) Water Quality Testing

Per Condition Of Approval (COA) 76 Within ninety (90) days of RPA approval, the Mine Operator shall begin and continue throughout the backfilling and reclamation phases and for 5 years following completion of reclamation and for 5 years following the start of groundwater discharge from the Quarry Pit into Permanente Creek as described on page 4.10-39 of the Final Environmental Impact Report, a Verification and Water Quality Monitoring Program. The Mine Operator shall implement the following:

a. Collect quarterly Quarry pit water samples and analyze for general water chemistry and dissolved and total metals, including selenium.

b. Perform quarterly electrical conductivity and pH measurements of the Quarry water.

c. Measure and record daily volume of any water that is pumped from the pit area.

g. Sample and test groundwater discharge from the Quarry Pit into Permanente Creek following reclamation as described on page 4.10-39 of the Final Environmental Impact Report to confirm that water quality in discharge meets Basin Plan Benchmarks and all other applicable water quality standards.

To ensure compliance with the above listed COA Quarterly, Lehigh Staff, or Golder Associates as their representative, took samples of the water in the Quarry pit. The samples were collected from Pond 4A and analyzed for total metals and general water chemistry parameters. Quarterly sampling results of the Quarry pit water are listed on Table 1. Daily volumes of water pumped from the pit are presented in Table 2. The third quarter 2013 sampling event is scheduled for September 2013.

Table 1: Quarry Pit Water (Pond 4A)

Sample Date	12/26/2012	3/20/2013	5/30/2013 2
Metals (total, 200 series)			
Antimony (ug/L)	ND	4.5	7.6
Arsenic (ug/L)	ND	1.6	1.3
Barium (ug/L)	11	32	NA
Beryllium (ug/L)	ND	ND	ND
Cadmium (ug/L)	ND	0.64	0.16
Chromium (ug/L)	ND	0.55	ND
Cobalt (ug/L)	ND	1.3	NA
Copper (ug/L)	ND	0.88	0.65
Lead (ug/L)	ND	ND	0.030
Mercury (ug/L)	ND1	0.0052	0.00171
Molybdenum (ug/L)	ND	360	NA
Nickel (ug/L)	91	61	57
Selenium (ug/L)	40	28	31
Silver (ug/L)	ND	ND	ND
Thallium (ug/L)	ND	0.19	0.20
Vanadium (ug/L)	110	130	NA
Zinc (ug/L)	58	44	8.4
Additional Parameters			
Chloride (mg/L)	10	12	15
Oil & Grease (mg/L)	ND	ND	ND
Turbidity – Field (NTU)	44	18	10.2
Total Dissolved Solids (mg/L)	900	1100	950
Total Suspended Solids (mg/L)	32	1.6	1.2
Total Settleable Solids (mL/L/hr)	ND	ND	2.0
Residual Chlorine (mg/L)	ND	ND	ND
pH - Field (s.u.)	8.56	7.87	7.99
Temperature - Field (°C)	NA	23.72	21.68
DO - Field (mg/L)	NA	6.69	6.86
ORP - Field (mV)	NA	33.2	114.4
Electrical Conductivity - Field (µS/cm)	NA	1420	1097

Notes:
1 = EPA method 245.1; the remaining mercury samples analyzed via EPA method 1631E
2 = 24-hour composite sample for metals (except Hg) and TSS on 3/20/2013 and 5/30/13
ND = not detected above the laboratory reporting limit
NA = not analyzed
March 2013 temp, DO, EC, and ORP readings were collected on 3/23/13.

Table 2. Lehigh Southwest Cement
Company: Permanente Plant
RPA - Pond 4a flow rates - 3rd quater 2012

Start Date: 7/1/2012
End Date: 9/30/2012

	Quarry Pump Run Hours	Avg. 24 Hr Flow	Daily Throughput
	Hours	*GPM*	*Gallons*
Tag:	QUARRY.9PW03RUN*24	QUARRY.9UPPERFOUT	
7/1/2012	7.68	364.77	168,160
7/2/2012	4.37	191.27	50,112
7/3/2012	8.28	364.82	181,316
7/4/2012	6.60	282.10	111,710
7/5/2012	17.23	391.17	404,277
7/6/2012	16.27	329.44	321,535
7/7/2012	5.49	186.68	61,512
7/8/2012	6.47	265.22	102,905
7/9/2012	7.63	275.75	126,295
7/10/2012	11.67	331.59	232,112
7/11/2012	18.96	341.75	388,737
7/12/2012	17.07	248.00	253,955
7/13/2012	19.47	295.70	345,381
7/14/2012	7.93	193.07	91,805
7/15/2012	7.42	302.04	134,408
7/16/2012	19.21	460.02	530,168
7/17/2012	13.58	364.87	297,366
7/18/2012	4.76	79.21	22,615
7/19/2012	19.06	322.61	368,902
7/20/2012	12.29	198.42	146,331
7/21/2012	5.13	158.48	48,813
7/22/2012	6.82	201.63	82,468
7/23/2012	19.56	321.96	377,821
7/24/2012	13.72	217.60	179,088
7/25/2012	15.40	247.50	228,690
7/26/2012	15.93	192.37	183,811
7/27/2012	16.18	237.93	230,912
7/28/2012	7.81	128.39	60,153
7/29/2012	5.40	193.86	62,811
7/30/2012	19.08	329.10	376,657
7/31/2012	4.09	70.56	17,324
8/1/2012	17.56	342.62	360,950
8/2/2012	12.57	201.44	151,884
8/3/2012	12.85	194.14	149,684
8/4/2012	7.68	124.29	57,237
8/5/2012	4.72	175.72	49,730
8/6/2012	11.63	185.64	129,484
8/7/2012	15.93	252.82	241,696
8/8/2012	19.37	294.51	342,217
8/9/2012	18.97	236.08	268,664
8/10/2012	15.42	117.37	108,565
8/11/2012	24.00	134.59	193,816
8/12/2012	24.00	277.11	399,040
8/13/2012	15.33	312.77	287,751
8/14/2012	8.54	133.07	68,199

Table 2. Lehigh Southwest Cement
Company: Permanente Plant
RPA - Pond 4a flow rates - 3rd quater 2012

Start Date: 7/1/2012
End Date: 9/30/2012

	Quarry Pump Run Hours	Avg. 24 Hr Flow	Daily Throughput
	Hours	*GPM*	*Gallons*
Tag:	QUARRY.9PW03RUN*24	QUARRY.9UPPERFOUT	
8/15/2012	19.31	307.21	355,908
8/16/2012	15.45	205.67	190,659
8/17/2012	18.82	171.35	193,457
8/18/2012	7.31	165.68	72,651
8/19/2012	7.60	148.98	67,933
8/20/2012	19.16	242.27	278,486
8/21/2012	19.37	250.47	291,052
8/22/2012	12.62	161.34	122,133
8/23/2012	0.06	0.55	2
8/24/2012	18.98	286.54	326,225
8/25/2012	0.21	2.90	36
8/26/2012	0.00	0.00	-
8/27/2012	5.73	120.17	41,337
8/28/2012	19.14	446.60	512,916
8/29/2012	7.53	188.24	84,989
8/30/2012	0.00	0.01	-
8/31/2012	0.00	0.01	-
9/1/2012	7.42	310.96	138,376
9/2/2012	0.00	0.01	-
9/3/2012	0.00	0.01	-
9/4/2012	19.19	627.09	722,098
9/5/2012	6.58	99.69	39,329
9/6/2012	0.00	0.00	-
9/7/2012	3.40	169.71	34,621
9/8/2012	7.40	279.41	124,059
9/9/2012	0.00	0.01	-
9/10/2012	10.15	230.28	140,241
9/11/2012 0:00	19.21	308.15	355,148
9/12/2012 0:00	9.00	120.33	64,979
9/13/2012 0:00	19.46	237.76	277,579
9/14/2012 0:00	7.80	102.23	47,845
9/15/2012 0:00	0.00	0.01	-
9/16/2012 0:00	0.00	0.01	-
9/17/2012 0:00	17.50	563.54	591,720
9/18/2012 0:00	15.84	308.74	293,460
9/19/2012 0:00	0.16	2.72	26
9/20/2012 0:00	0.00	0.00	-
9/21/2012 0:00	0.00	0.00	-
9/22/2012 0:00	0.00	0.00	-
9/23/2012 0:00	0.00	0.00	-
9/24/2012 0:00	0.00	0.00	-
9/25/2012 0:00	0.00	0.00	-
9/26/2012 0:00	0.00	0.00	-
9/27/2012 0:00	0.00	0.00	-
9/28/2012 0:00	3.40	145.09	29,599

Table 2. Lehigh Southwest Cement Company:
Permanente Plant
RPA - Pond 4a flow rates - 3rd quater 2012

Start Date: 7/1/2012
End Date: 9/30/2012

	Quarry Pump Run Hours *Hours*	**Avg. 24 Hr Flow** *GPM*	**Daily Throughput** *Gallons*
Tag:	QUARRY.9PW03RUN*24	QUARRY.9UPPERFOUT	
9/29/2012 0:00	12.75	732.95	560,703
9/30/2012 0:00	7.35	227.14	100,169