NPDES CORRESPONDENCE

July 3, 2008

Cynthia McCowan, KFP 1A-KST

KINGSTON FOSSIL PLANT SPILLWAY (WEIR) CERTIFICATION

Survey and inspection of the circular spillways located in the Settling Pond (DSN 001) was conducted on July 1st and 2nd. The spillways were inspected and surveyed for settlement. The survey was based on a painted nail (EL. 762.17) in the walkway to Spillway A. No significant leakage was visible; only Spillways B, C, and D could be inspected for leakage due to backpressure from the diffuser system. On July 1st, it was noted that Spillways E and F were submerged due to downstream blockage in the diffuser system; the plant was notified immediately. Attached are photos showing the condition of Spillways E and F. On July 2nd, it was noted that Spillways C and D were starting to back up due to blockage downstream in the diffuser system. Plant personal came out and reviewed the situation. The blockages are believed to be due to recent grass mowing operations around the pond. As long as the blockages exist, the risk of a heavy rain storm causing the pond to overtop the dike exists. The rating table is invalid as long as the blockage remains and should be corrected as soon as possible.

Calculations for the spillways were completed using the equation $Q=CLH^{1.5}$, where "Q" is the flow (cfs), "C" is the coefficient of discharge, "L" is the length or circumference of the spillway (feet), and "H" is the head or height of water above the spillway crest (feet). A "C" coefficient of 3.55 was used based on flow conditions. "C" is dependent on the head flowing over the spillway; therefore the "C" value changes as the water depth or head increases. The configuration of flow changes for heads exceeding approximately one foot and additional testing would be required to determine the discharge coefficients for each spillway at this head level. However, it is not anticipated that the head will ever go as high as one foot.

It should be noted that several factors could impede flow and affect the calculations of discharge. These factors include, but are not limited to, the angle iron braces that lie in the path of flow over the spillway, shape of the weir plate, algae, etc. We do not consider these in the calculation of flow because they are difficult to accurately represent and provide only minor impacts.

Flow measurements were not possible due to the diffuser access ports being under pressure. The existing staff plate was replaced with a new staff plate.

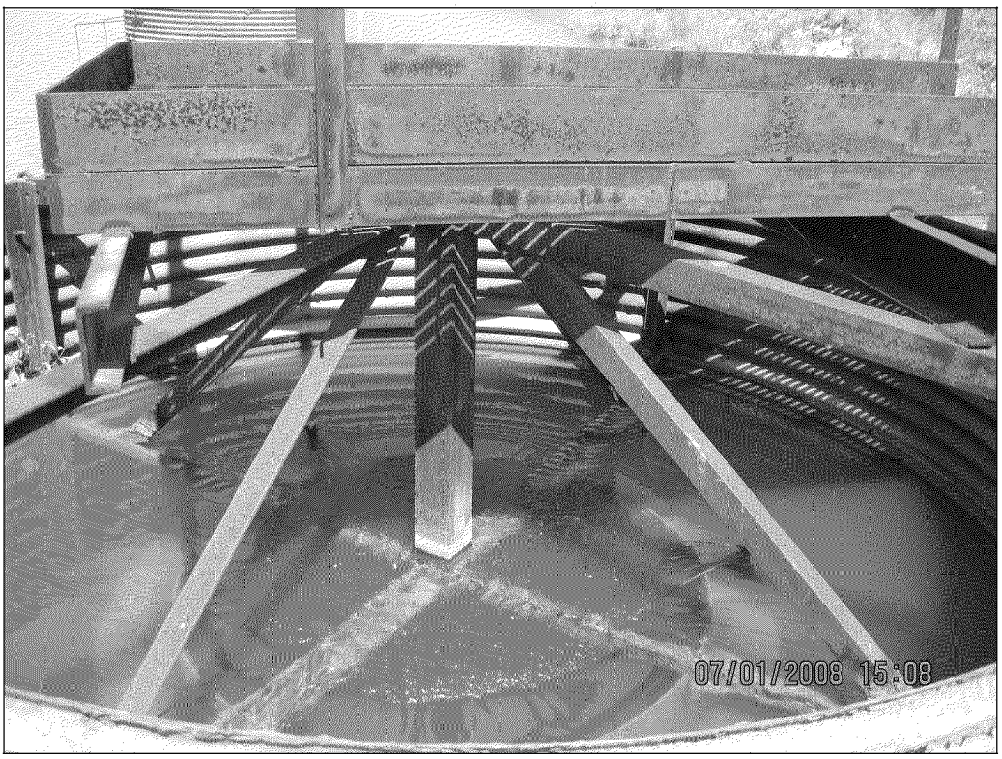
Attached is the rating table for spillways B, C, D, E, and F. If you have any questions or need further assistance, please feel free to call me at (256) 386-2424. Thank you for the opportunity to be of service.

Stuart Harris

Stuart Harris, PE
Civil Engineer
Environmental Engineering Services-West
CTR 2L-M

SRH:SFH
Attachment
Cc (Attachment):
R. A. Almond, CTR 2L-M
M. A. Hedgecoth, LP 2L-C
L. P. Johnson, LP 5D-C
EDMS, CTR 1B-M

PHOTOS



Spillway E with blockage

Spillway F with blockage

KINGSTON FOSSIL PLANT
STILLING POND SPILLWAY DISCHARGE DSN 001

Elevation	Head	Spillway Discharge (cfs)					Total Discharge		Elevation	Head	Spillway Discharge (cfs)					Total Discharge	
(ft)	(ft)	B	C	D	E	F	cfs	mgd	(ft)	(ft)	B	C	D	E	F	cfs	mgd
754.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	754.73	0.31	5.80	6.04	7.69	6.67	7.11	33.30	21.52
754.43	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	754.74	0.32	6.16	6.40	8.09	7.05	7.49	35.20	22.75
754.44	0.02	0.00	0.00	0.02	0.00	0.04	0.06	0.04	754.75	0.33	6.54	6.78	8.50	7.44	7.89	37.14	24.01
754.45	0.03	0.00	0.01	0.07	0.00	0.09	0.17	0.11	754.76	0.34	6.92	7.16	8.91	7.84	8.29	39.12	25.28
754.46	0.04	0.00	0.04	0.16	0.01	0.18	0.38	0.25	754.77	0.35	7.30	7.54	9.33	8.25	8.70	41.13	26.58
754.47	0.05	0.00	0.08	0.27	0.07	0.23	0.65	0.42	754.78	0.36	7.70	7.94	9.76	8.66	9.12	43.17	27.90
754.48	0.06	0.00	0.15	0.41	0.12	0.32	1.00	0.64	754.79	0.37	8.10	8.34	10.19	9.08	9.54	45.25	29.24
754.49	0.07	0.02	0.25	0.57	0.21	0.44	1.47	0.95	754.80	0.38	8.50	8.75	10.63	9.50	9.97	47.36	30.60
754.50	0.08	0.07	0.30	0.74	0.33	0.57	2.00	1.29	754.81	0.39	8.92	9.16	11.08	9.94	10.40	49.50	31.99
754.51	0.09	0.16	0.39	0.93	0.47	0.73	2.67	1.72	754.82	0.40	9.34	9.58	11.53	10.37	10.84	51.67	33.39
754.52	0.10	0.27	0.50	1.13	0.62	0.90	3.43	2.22	754.83	0.41	9.76	10.01	11.99	10.82	11.29	53.87	34.82
754.53	0.11	0.41	0.64	1.34	0.80	1.09	4.29	2.77	754.84	0.42	10.20	10.45	12.45	11.27	11.74	56.11	36.26
754.54	0.12	0.57	0.80	1.57	0.99	1.30	5.22	3.37	754.85	0.43	10.64	10.89	12.92	11.73	12.20	58.37	37.73
754.55	0.13	0.74	0.97	1.81	1.19	1.51	6.23	4.02	754.86	0.44	11.08	11.33	13.39	12.19	12.67	60.67	39.21
754.56	0.14	0.93	1.16	2.06	1.41	1.74	7.30	4.72	754.87	0.45	11.53	11.78	13.88	12.66	13.14	63.00	40.71
754.57	0.15	1.13	1.36	2.32	1.64	1.98	8.43	5.45	754.88	0.46	11.99	12.24	14.36	13.14	13.62	65.35	42.23
754.58	0.16	1.34	1.58	2.59	1.88	2.23	9.63	6.22	754.89	0.47	12.46	12.71	14.85	13.62	14.10	67.73	43.77
754.59	0.17	1.57	1.80	2.87	2.14	2.49	10.88	7.03	754.90	0.48	12.93	13.18	15.35	14.10	14.59	70.15	45.33
754.60	0.18	1.81	2.04	3.16	2.40	2.76	12.18	7.87	754.91	0.49	13.40	13.65	15.85	14.60	15.08	72.59	46.91
754.61	0.19	2.06	2.29	3.46	2.67	3.05	13.54	8.75	754.92	0.50	13.88	14.13	16.36	15.09	15.58	75.05	48.51
754.62	0.20	2.32	2.55	3.77	2.96	3.34	14.94	9.66	754.93	0.51	14.37	14.62	16.87	15.60	16.09	77.55	50.12
754.63	0.21	2.59	2.83	4.09	3.25	3.64	16.40	10.60	754.94	0.52	14.86	15.11	17.39	16.11	16.60	80.07	51.75
754.64	0.22	2.87	3.11	4.41	3.56	3.95	17.90	11.57	754.95	0.53	15.36	15.61	17.92	16.62	17.11	82.62	53.40
754.65	0.23	3.16	3.40	4.75	3.87	4.27	19.45	12.57	754.96	0.54	15.86	16.12	18.45	17.14	17.64	85.20	55.06
754.66	0.24	3.46	3.70	5.09	4.19	4.59	21.04	13.59	754.97	0.55	16.37	16.63	18.98	17.67	18.16	87.80	56.74
754.67	0.25	3.77	4.01	5.44	4.52	4.93	22.67	14.65	754.98	0.56	16.88	17.14	19.52	18.20	18.69	90.43	58.44
754.68	0.26	4.09	4.33	5.80	4.86	5.27	24.34	15.73	754.99	0.57	17.40	17.66	20.06	18.73	19.23	93.09	60.16
754.69	0.27	4.42	4.65	6.16	5.20	5.62	26.06	16.84	755.00	0.58	17.92	18.19	20.61	19.27	19.77	95.77	61.89
754.70	0.28	4.75	4.99	6.53	5.56	5.98	27.81	17.97	755.01	0.59	18.45	18.72	21.17	19.82	20.32	98.48	63.64
754.71	0.29	5.09	5.33	6.91	5.92	6.35	29.60	19.13	755.02	0.60	18.99	19.25	21.73	20.37	20.87	101.21	65.41
754.72	0.30	5.44	5.68	7.30	6.29	6.72	31.43	20.31	755.03	0.61	19.53	19.79	22.29	20.93	21.43	103.96	67.19

NOTE 1: KIF uses Head to determine flow rate.

NOTE 2: Elevation data has not been verified.

Non-Certified 7/3/08

KINGSTON FOSSIL PLANT
STILLING POND SPILLWAY DISCHARGE DSN 001

Elevation	Head	Spillway Discharge (cfs)					Total Discharge		Elevation	Head	Spillway Discharge (cfs)					Total Discharge	
(ft)	(ft)	B	C	D	E	F	cfs	mgd	(ft)	(ft)	B	C	D	E	F	cfs	mgd
755.04	0.62	20.07	20.34	22.86	21.49	21.99	106.75	68.99	755.35	0.93	39.23	39.53	42.68	41.16	41.64	204.24	131.99
755.05	0.63	20.62	20.89	23.43	22.06	22.56	109.55	70.80	755.36	0.94	39.92	40.22	43.39	41.86	42.34	207.72	134.24
755.06	0.64	21.18	21.44	24.01	22.63	23.13	112.38	72.63	755.37	0.95	40.61	40.91	44.09	42.57	43.04	211.22	136.50
755.07	0.65	21.74	22.00	24.59	23.20	23.70	115.24	74.47	755.38	0.96	41.30	41.60	44.81	43.28	43.75	214.74	138.78
755.08	0.66	22.30	22.57	25.18	23.78	24.28	118.11	76.33	755.39	0.97	42.00	42.30	45.52	43.99	44.46	218.28	141.07
755.09	0.67	22.87	23.14	25.77	24.37	24.87	121.02	78.21	755.40	0.98	42.70	43.00	46.24	44.71	45.18	221.84	143.37
755.10	0.68	23.44	23.71	26.37	24.96	25.46	123.94	80.10	755.41	0.99	43.40	43.71	46.97	45.43	45.90	225.42	145.68
755.11	0.69	24.02	24.29	26.97	25.55	26.05	126.89	82.01	755.42	1.00	44.11	44.42	47.70	46.16	46.62	229.01	148.01
755.12	0.70	24.60	24.88	27.58	26.15	26.65	129.86	83.93	755.43	1.01	44.83	45.14	48.43	46.89	47.35	232.63	150.34
755.13	0.71	25.19	25.47	28.19	26.76	27.26	132.86	85.86	755.44	1.02	45.54	45.85	49.16	47.62	48.08	236.27	152.69
755.14	0.72	25.78	26.06	28.80	27.37	27.87	135.88	87.81	755.45	1.03	46.26	46.58	49.90	48.36	48.82	239.92	155.05
755.15	0.73	26.38	26.66	29.42	27.98	28.48	138.92	89.78	755.46	1.04	46.99	47.30	50.65	49.10	49.56	243.59	157.43
755.16	0.74	26.98	27.26	30.04	28.60	29.10	141.98	91.76	755.47	1.05	47.72	48.03	51.39	49.85	50.30	247.28	159.81
755.17	0.75	27.59	27.87	30.67	29.22	29.72	145.06	93.75	755.48	1.06	48.45	48.77	52.14	50.59	51.04	250.99	162.21
755.18	0.76	28.20	28.48	31.30	29.85	30.34	148.17	95.76	755.49	1.07	49.18	49.50	52.90	51.35	51.79	254.72	164.62
755.19	0.77	28.81	29.09	31.94	30.48	30.98	151.30	97.78	755.50	1.08	49.92	50.24	53.65	52.10	52.55	258.47	167.04
755.20	0.78	29.43	29.71	32.58	31.11	31.61	154.45	99.82	755.51	1.09	50.67	50.99	54.41	52.86	53.30	262.23	169.47
755.21	0.79	30.06	30.34	33.22	31.75	32.25	157.62	101.87	755.52	1.10	51.41	51.74	55.18	53.63	54.07	266.02	171.92
755.22	0.80	30.68	30.97	33.87	32.40	32.89	160.82	103.93	755.53	1.11	52.16	52.49	55.95	54.39	54.83	269.82	174.38
755.23	0.81	31.32	31.60	34.53	33.05	33.54	164.03	106.01	755.54	1.12	52.92	53.24	56.72	55.16	55.60	273.64	176.84
755.24	0.82	31.95	32.24	35.18	33.70	34.19	167.27	108.10	755.55	1.13	53.68	54.00	57.49	55.94	56.37	277.47	179.32
755.25	0.83	32.59	32.88	35.84	34.36	34.85	170.53	110.21	755.56	1.14	54.44	54.76	58.27	56.71	57.14	281.33	181.82
755.26	0.84	33.24	33.53	36.51	35.02	35.51	173.81	112.33	755.57	1.15	55.20	55.53	59.05	57.50	57.92	285.20	184.32
755.27	0.85	33.89	34.18	37.18	35.69	36.17	177.11	114.46	755.58	1.16	55.97	56.30	59.84	58.28	58.70	289.09	186.83
755.28	0.86	34.54	34.83	37.85	36.36	36.84	180.43	116.60	755.59	1.17	56.74	57.07	60.63	59.07	59.49	293.00	189.36
755.29	0.87	35.20	35.49	38.53	37.03	37.52	183.77	118.76	755.60	1.18	57.52	57.85	61.42	59.86	60.28	296.92	191.89
755.30	0.88	35.86	36.15	39.21	37.71	38.19	187.13	120.94	755.61	1.19	58.30	58.63	62.21	60.66	61.07	300.87	194.44
755.31	0.89	36.53	36.82	39.90	38.39	38.87	190.51	123.12	755.62	1.20	59.08	59.41	63.01	61.46	61.87	304.83	197.00
755.32	0.90	37.20	37.49	40.59	39.08	39.56	193.91	125.32	755.63	1.21	59.86	60.20	63.82	62.26	62.67	308.80	199.57
755.33	0.91	37.87	38.17	41.28	39.77	40.25	197.33	127.53	755.64	1.22	60.65	60.99	64.62	63.06	63.47	312.80	202.15
755.34	0.92	38.55	38.85	41.98	40.46	40.94	200.77	129.75	755.65	1.23	61.45	61.78	65.43	63.87	64.28	316.81	204.75

NOTE 1: KIF uses Head to determine flow rate.

NOTE 2: Elevation data has not been verified.