KJE PPP Project Phase 1 ESIA

Technical Appendix Noise & Vibration

Rev2

NOISE & VIBRATION

Methodology

Several studies have been conducted as part of the ESIA process to characterise baseline noise and vibration levels along Phase 1 of the KJE alignment. A brief methodology for each study along with a map of all sites are presented below.

Earth Systems 2018

The primary aim of the work was to collect noise and vibration data from the eastern section of the Phase 1 alignment to complement existing data collected over several past studies which focussed on Kampala city. Noise data was collected using a combination of 24-hour noise monitoring via a Casella CEL-246 sound level meter and spot monitoring via a Casella CEL-240 sound level. Spot measurements were taken for one hour three times per day (morning, afternoon and evening). Ten-minute vibration measurements were collected at each site six times per day (twice each during morning, afternoon and evening). Vibration was measured using a vibration measurement app.

Atacama 2017

Atacama conducted noise measurements at seven locations using a CEM DT-8852 Data logger sound level meter in June 2017. Measurements were taken at 30 second intervals for the first five minutes of every hour for eight consecutive hours.

ICS 2013

Noise measurements were carried out along the KSB site during April/May 2013. A detailed methodology was not provided in the corresponding ESIA (ICS 2015).

JICA / UNRA 2013

Noise monitoring was conducted in Kampala city by a JICA survey team on behalf of UNRA in September 2013. The team surveyed five locations collecting one-hour measurements over six time periods throughout the day.

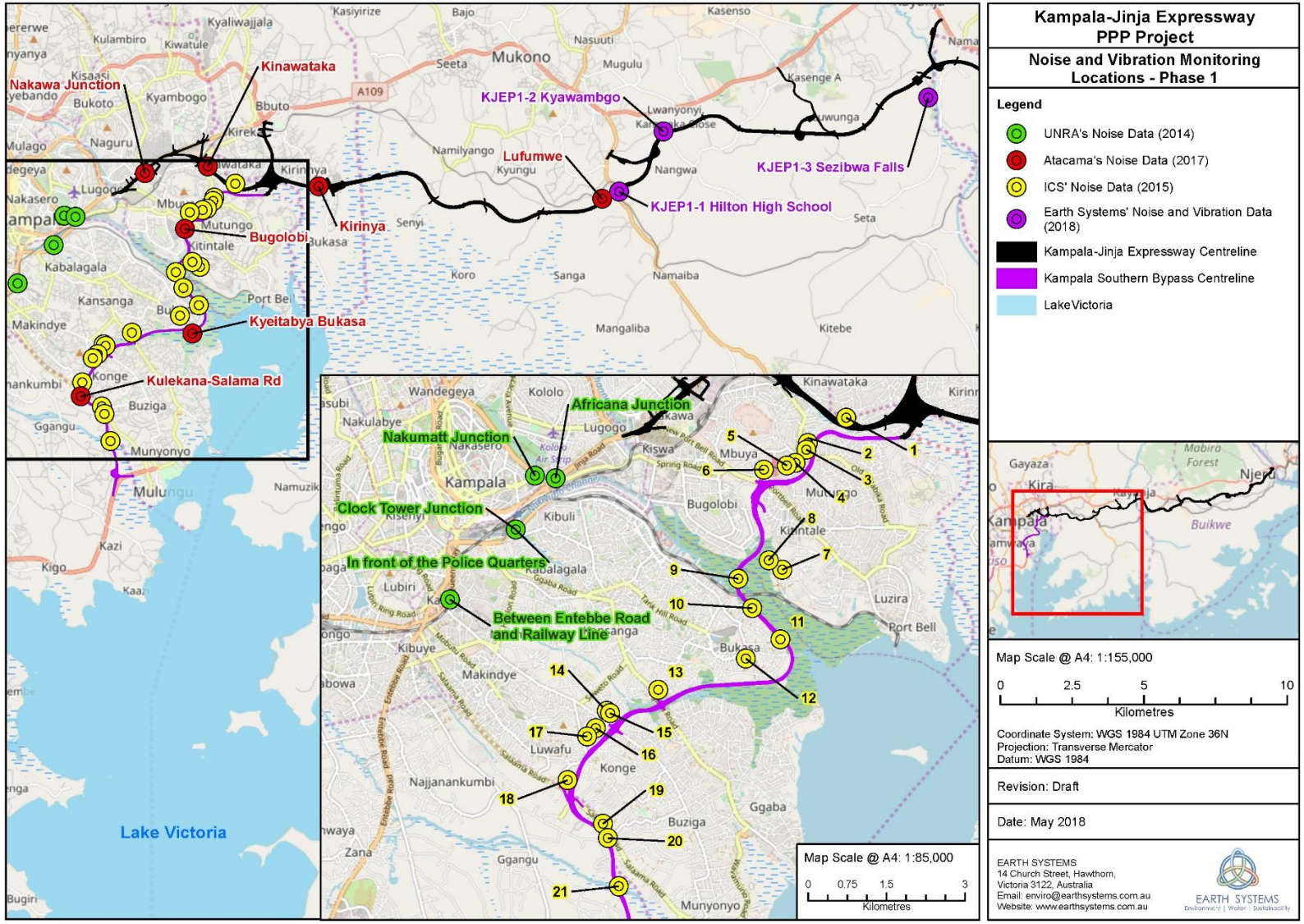

Figure 1: Noise and Vibration Monitoring Locations – Phase 1

Noise Data

Earth Systems 2018

Table 1: KJEP1-1 Hilton High School

Date	Time	Noise (dBA)
14-May-18	7:10:00 AM	48.5
14-May-18	7:15:00 AM	53.3
14-May-18	7:20:00 AM	51.9
14-May-18	7:25:00 AM	46.9
14-May-18	7:30:00 AM	54.6
14-May-18	7:35:00 AM	55.2
14-May-18	7:40:00 AM	56.9
14-May-18	7:45:00 AM	52.2
14-May-18	7:50:00 AM	54.6
14-May-18	7:55:00 AM	51.3
14-May-18	8:00:00 AM	50.8
14-May-18	8:05:00 AM	57.5
14-May-18	8:10:00 AM	53.6
14-May-18	1:15:00 PM	46.7
14-May-18	1:20:00 PM	56.8
14-May-18	1:25:00 PM	49.1
14-May-18	1:30:00 PM	47.0
14-May-18	1:35:00 PM	52.3
14-May-18	1:40:00 PM	56.9
14-May-18	1:45:00 PM	52.9
14-May-18	1:50:00 PM	55.9
14-May-18	1:55:00 PM	51.4
14-May-18	2:00:00 PM	49.9
14-May-18	2:05:00 PM	58.3
14-May-18	2:10:00 PM	48.4
14-May-18	2:15:00 PM	50.3
14-May-18	7:10:00 PM	63.4
14-May-18	7:15:00 PM	51.9
14-May-18	7:20:00 PM	53.5
14-May-18	7:25:00 PM	58.4
14-May-18	7:30:00 PM	50.4
14-May-18	7:35:00 PM	53.4
14-May-18	7:40:00 PM	50.1
14-May-18	7:45:00 PM	56.5
14-May-18	7:50:00 PM	49.3
14-May-18	7:55:00 PM	52.1

14-May-18	8:00:00 PM	46.2
14-May-18	8:05:00 PM	48.3
14-May-18	8:10:00 PM	46.9

Table 1.1: KJEP1-2 Kyawambogo

Date	Time	Noise Level (dB A)
25-Mar	6 PM	50.7
25-Mar	7 PM	50.1
25-Mar	8 PM	50.4
25-Mar	9 PM	50.4
25-Mar	10 PM	49.8
25-Mar	11 PM	50.0
26-Mar	12 AM	48.2
26-Mar	1 AM	48.4
26-Mar	2 AM	48.6
26-Mar	3 AM	47.3
26-Mar	4 AM	45.2
26-Mar	5 AM	44.9
26-Mar	6 AM	47.7
26-Mar	7 AM	53.6
26-Mar	8 AM	51.0
26-Mar	9 AM	46.2
26-Mar	10 AM	46.0
26-Mar	11 AM	44.9
26-Mar	12 PM	44.9
26-Mar	1 PM	44.4
26-Mar	2 PM	45.9
26-Mar	3 PM	44.4
26-Mar	4 PM	44.3
26-Mar	5 PM	45.8

Table 1.2: KJEP1-3 Ssezibwa Falls

Date	Time	Noise Level (dB A)
26-Mar	7 PM	58.1
26-Mar	8 PM	58.0
27-Mar	9 AM	52.5
27-Mar	10 AM	52.5

Plate 1: Hilton High School monitoring site (KJEP1-1)

Plate 2: Kyawambogo monitoring site (KJEP1-2)

Atacama 2017

Table 2: Nakawa Junction

Date	Time	Sample	Noise LA
20/06/2017	10:10:00 AM	1	67.1
20/06/2017	10:10:30 AM	2	79.3
20/06/2017	10:11:00 AM	3	67.5
20/06/2017	10:11:30 AM	4	74.7
20/06/2017	10:12:00 AM	5	73.3
20/06/2017	10:12:30 AM	6	94.1
20/06/2017	10:13:00 AM	7	69.0
20/06/2017	10:13:30 AM	8	74.8
20/06/2017	10:14:00 AM	9	70.2
20/06/2017	10:14:30 AM	10	81.6
20/06/2017	11:10:00 AM	11	70.6
20/06/2017	11:10:30 AM	12	74.8
20/06/2017	11:11:00 AM	13	67.9
20/06/2017	11:11:30 AM	14	77.3
20/06/2017	11:12:00 AM	15	65.0
20/06/2017	11:12:30 AM	16	88.8
20/06/2017	11:13:00 AM	17	70.1
20/06/2017	11:13:30 AM	18	84.7
20/06/2017	11:14:00 AM	19	69.8
20/06/2017	11:14:30 AM	20	79.6
20/06/2017	12:10:00 PM	21	70.4
20/06/2017	12:10:30 PM	22	78.8
20/06/2017	12:11:00 PM	23	71.2
20/06/2017	12:11:30 PM	24	76.1
20/06/2017	12:12:00 PM	25	68.1
20/06/2017	12:12:30 PM	26	79.2

Date	Time	Sample	Noise LA
20/06/2017	12:13:00 PM	27	69.3
20/06/2017	12:13:30 PM	28	82.5
20/06/2017	12:14:00 PM	29	69.4
20/06/2017	12:14:30 PM	30	86.3
20/06/2017	1:10:00 PM	31	68.0
20/06/2017	1:10:30 PM	32	79.0
20/06/2017	1:11:00 PM	33	71.6
20/06/2017	1:11:30 PM	34	78.0
20/06/2017	1:12:00 PM	35	68.4
20/06/2017	1:12:30 PM	36	82.3
20/06/2017	1:13:00 PM	37	67.3
20/06/2017	1:13:30 PM	38	92.1
20/06/2017	1:14:00 PM	39	70.6
20/06/2017	1:14:30 PM	40	83.1
20/06/2017	2:10:00 PM	41	66.7
20/06/2017	2:10:30 PM	42	77.1
20/06/2017	2:11:00 PM	43	70.0
20/06/2017	2:11:30 PM	44	73.8
20/06/2017	2:12:00 PM	45	73.0
20/06/2017	2:12:30 PM	46	81.2
20/06/2017	2:13:00 PM	47	68.3
20/06/2017	2:13:30 PM	48	76.1
20/06/2017	2:14:00 PM	49	67.7
20/06/2017	2:14:30 PM	50	78.0
20/06/2017	3:10:00 PM	51	69.3
20/06/2017	3:10:30 PM	52	78.0
20/06/2017	3:11:00 PM	53	73.8
20/06/2017	3:11:30 PM	54	87.8
20/06/2017	3:12:00 PM	55	69.6
20/06/2017	3:12:30 PM	56	88.0
20/06/2017	3:13:00 PM	57	68.7
20/06/2017	3:13:30 PM	58	97.6
20/06/2017	3:14:00 PM	59	68.1
20/06/2017	3:14:30 PM	60	91.3
20/06/2017	4:10:00 PM	61	69.6
20/06/2017	4:10:30 PM	62	80.8
20/06/2017	4:11:00 PM	63	73.0
20/06/2017	4:11:30 PM	64	82.2
20/06/2017	4:12:00 PM	65	66.9
20/06/2017	4:12:30 PM	66	73.3
20/06/2017	4:13:00 PM	67	66.1
20/06/2017	4:13:30 PM	68	79.6
20/06/2017	4:14:00 PM	69	70.7

Date	Time	Sample	Noise LA
20/06/2017	4:14:30 PM	70	81.6
20/06/2017	5:10:00 PM	71	68.3
20/06/2017	5:10:30 PM	72	89.2
20/06/2017	5:11:00 PM	73	67.9
20/06/2017	5:11:30 PM	74	76.4
20/06/2017	5:12:00 PM	75	72.8
20/06/2017	5:12:30 PM	76	79.1
20/06/2017	5:13:00 PM	77	72.0
20/06/2017	5:13:30 PM	78	78.8
20/06/2017	5:14:00 PM	79	68.4
20/06/2017	5:14:30 PM	80	75.5

Table 2.1: Kinawataka

Date	Time	Sample	Noise LA
21/06/2017	10:12:00 AM	1	64.8
21/06/2017	10:12:30 AM	2	80.8
21/06/2017	10:13:00 AM	3	67.6
21/06/2017	10:13:30 AM	4	78.6
21/06/2017	10:14:00 AM	5	64.8
21/06/2017	10:14:30 AM	6	71.0
21/06/2017	10:15:00 AM	7	65.3
21/06/2017	10:15:30 AM	8	73.4
21/06/2017	10:16:00 AM	9	65.9
21/06/2017	10:16:30 AM	10	67.7
21/06/2017	11:12:00 AM	11	52.0
21/06/2017	11:12:30 AM	12	62.0
21/06/2017	11:13:00 AM	13	52.8
21/06/2017	11:13:30 AM	14	67.4
21/06/2017	11:14:00 AM	15	52.3
21/06/2017	11:14:30 AM	16	69.4
21/06/2017	11:15:00 AM	17	48.2
21/06/2017	11:15:30 AM	18	63.9
21/06/2017	11:16:00 AM	19	49.3
21/06/2017	11:16:30 AM	20	55.8
21/06/2017	12:12:00 PM	21	47.4
21/06/2017	12:12:30 PM	22	63.6
21/06/2017	12:13:00 PM	23	51.8
21/06/2017	12:13:30 PM	24	74.8
21/06/2017	12:14:00 PM	25	51.5
21/06/2017	12:14:30 PM	26	58.9
21/06/2017	12:15:00 PM	27	51.1
21/06/2017	12:15:30 PM	28	60.1

Date	Time	Sample	Noise LA
21/06/2017	12:16:00 PM	29	55.1
21/06/2017	12:16:30 PM	30	65.3
21/06/2017	1:12:00 PM	31	50.4
21/06/2017	1:12:30 PM	32	58.3
21/06/2017	1:13:00 PM	33	48.8
21/06/2017	1:13:30 PM	34	57.1
21/06/2017	1:14:00 PM	35	49.9
21/06/2017	1:14:30 PM	36	55.6
21/06/2017	1:15:00 PM	37	50.9
21/06/2017	1:15:30 PM	38	67.4
21/06/2017	1:16:00 PM	39	50.7
21/06/2017	1:16:30 PM	40	58.0
21/06/2017	2:12:00 PM	41	48.5
21/06/2017	2:12:30 PM	42	66.1
21/06/2017	2:13:00 PM	43	49.0
21/06/2017	2:13:30 PM	44	67.7
21/06/2017	2:14:00 PM	45	48.8
21/06/2017	2:14:30 PM	46	69.1
21/06/2017	2:15:00 PM	47	47.5
21/06/2017	2:15:30 PM	48	55.0
21/06/2017	2:16:00 PM	49	45.4
21/06/2017	2:16:30 PM	50	55.3
21/06/2017	3:12:00 PM	51	49.9
21/06/2017	3:12:30 PM	52	57.5
21/06/2017	3:13:00 PM	53	52.8
21/06/2017	3:13:30 PM	54	64.0
21/06/2017	3:14:00 PM	55	47.0
21/06/2017	3:14:30 PM	56	53.0
21/06/2017	3:15:00 PM	57	46.7
21/06/2017	3:15:30 PM	58	54.4
21/06/2017	3:16:00 PM	59	45.8
21/06/2017	3:16:30 PM	60	61.1
21/06/2017	4:12:00 PM	61	59.9
21/06/2017	4:12:30 PM	62	67.1
21/06/2017	4:13:00 PM	63	55.7
21/06/2017	4:13:30 PM	64	61.8
21/06/2017	4:14:00 PM	65	56.2
21/06/2017	4:14:30 PM	66	62.0
21/06/2017	4:15:00 PM	67	51.5
21/06/2017	4:15:30 PM	68	69.1
21/06/2017	4:16:00 PM	69	54.2
21/06/2017	4:16:30 PM	70	59.3
21/06/2017	5:12:00 PM	71	60.1

Date	Time	Sample	Noise LA
21/06/2017	5:12:30 PM	72	65.9
21/06/2017	5:13:00 PM	73	51.5
21/06/2017	5:13:30 PM	74	68.9
21/06/2017	5:14:00 PM	75	49.7
21/06/2017	5:14:30 PM	76	57.7
21/06/2017	5:15:00 PM	77	51.4
21/06/2017	5:15:30 PM	78	67.9
21/06/2017	5:16:00 PM	79	47.6
21/06/2017	5:16:30 PM	80	56.6

Table 2.2: Kirinya

Date	Time	Sample	Noise LA
22/06/2017	11:10:00 AM	1	37.6
22/06/2017	11:10:30 AM	2	54.0
22/06/2017	11:11:00 AM	3	42.3
22/06/2017	11:11:30 AM	4	49.5
22/06/2017	11:12:00 AM	5	41.1
22/06/2017	11:12:30 AM	6	52.2
22/06/2017	11:13:00 AM	7	41.2
22/06/2017	11:13:30 AM	8	52.4
22/06/2017	11:14:00 AM	9	41.3
22/06/2017	11:14:30 AM	10	50.5
22/06/2017	12:10:00 PM	11	41.8
22/06/2017	12:10:30 PM	12	68.4
22/06/2017	12:11:00 PM	13	37.7
22/06/2017	12:11:30 PM	14	57.1
22/06/2017	12:12:00 PM	15	42.6
22/06/2017	12:12:30 PM	16	48.1
22/06/2017	12:13:00 PM	17	37.8
22/06/2017	12:13:30 PM	18	46.1
22/06/2017	12:14:00 PM	19	39.8
22/06/2017	12:14:30 PM	20	45.8
22/06/2017	1:10:00 PM	21	50.5
22/06/2017	1:10:30 PM	22	55.6
22/06/2017	1:11:00 PM	23	51.3
22/06/2017	1:11:30 PM	24	53.7
22/06/2017	1:12:00 PM	25	50.7
22/06/2017	1:12:30 PM	26	53.0
22/06/2017	1:13:00 PM	27	51.1
22/06/2017	1:13:30 PM	28	53.6
22/06/2017	1:14:00 PM	29	51.7
22/06/2017	1:14:30 PM	30	54.4

Date	Time	Sample	Noise LA
22/06/2017	2:10:00 PM	31	45.2
22/06/2017	2:10:30 PM	32	52.8
22/06/2017	2:11:00 PM	33	43.7
22/06/2017	2:11:30 PM	34	55.8
22/06/2017	2:12:00 PM	35	48.0
22/06/2017	2:12:30 PM	36	49.5
22/06/2017	2:13:00 PM	37	48.2
22/06/2017	2:13:30 PM	38	57.7
22/06/2017	2:14:00 PM	39	47.1
22/06/2017	2:14:30 PM	40	51.7
22/06/2017	3:10:00 PM	41	43.3
22/06/2017	3:10:30 PM	42	48.2
22/06/2017	3:11:00 PM	43	41.7
22/06/2017	3:11:30 PM	44	53.0
22/06/2017	3:12:00 PM	45	44.8
22/06/2017	3:12:30 PM	46	50.7
22/06/2017	3:13:00 PM	47	43.7
22/06/2017	3:13:30 PM	48	54.6
22/06/2017	3:14:00 PM	49	39.9
22/06/2017	3:14:30 PM	50	45.9
22/06/2017	4:10:00 PM	51	45.0
22/06/2017	4:10:30 PM	52	57.2
22/06/2017	4:11:00 PM	53	43.4
22/06/2017	4:11:30 PM	54	49.0
22/06/2017	4:12:00 PM	55	44.6
22/06/2017	4:12:30 PM	56	55.3
22/06/2017	4:13:00 PM	57	45.1
22/06/2017	4:13:30 PM	58	51.8
22/06/2017	4:14:00 PM	59	46.4
22/06/2017	4:14:30 PM	60	57.4
22/06/2017	5:10:00 PM	61	44.9
22/06/2017	5:10:30 PM	62	52.9
22/06/2017	5:11:00 PM	63	50.5
22/06/2017	5:11:30 PM	64	53.8
22/06/2017	5:12:00 PM	65	48.2
22/06/2017	5:12:30 PM	66	52.5
22/06/2017	5:13:00 PM	67	50.6
22/06/2017	5:13:30 PM	68	54.9
22/06/2017	5:14:00 PM	69	49.1
22/06/2017	5:14:30 PM	70	53.7
22/06/2017	6:10:00 PM	71	49.1
22/06/2017	6:10:30 PM	72	56.0
22/06/2017	6:11:00 PM	73	43.3

Date	Time	Sample	Noise LA
22/06/2017	6:11:30 PM	74	58.5
22/06/2017	6:12:00 PM	75	41.8
22/06/2017	6:12:30 PM	76	51.7
22/06/2017	6:13:00 PM	77	38.8
22/06/2017	6:13:30 PM	78	53.4
22/06/2017	6:14:00 PM	79	43.5
22/06/2017	6:14:30 PM	80	51.9

Table 2.3: Lufumwe

Date	Time	Sample	Noise LA
23/06/2017	9:50:00 AM	1	43.2
23/06/2017	9:50:30 AM	2	54.0
23/06/2017	9:51:00 AM	3	43.9
23/06/2017	9:51:30 AM	4	78.8
23/06/2017	9:52:00 AM	5	44.9
23/06/2017	9:52:30 AM	6	58.1
23/06/2017	9:53:00 AM	7	45.0
23/06/2017	9:53:30 AM	8	48.2
23/06/2017	9:54:00 AM	9	48.3
23/06/2017	9:54:30 AM	10	53.4
23/06/2017	10:50:00 AM	11	42.3
23/06/2017	10:50:30 AM	12	51.9
23/06/2017	10:51:00 AM	13	43.4
23/06/2017	10:51:30 AM	14	48.7
23/06/2017	10:52:00 AM	15	44.1
23/06/2017	10:52:30 AM	16	48.5
23/06/2017	10:53:00 AM	17	42.5
23/06/2017	10:53:30 AM	18	45.9
23/06/2017	10:54:00 AM	19	44.3
23/06/2017	10:54:30 AM	20	47.3
23/06/2017	11:50:00 AM	21	42.5
23/06/2017	11:50:30 AM	22	54.9
23/06/2017	11:51:00 AM	23	42.8
23/06/2017	11:51:30 AM	24	51.0
23/06/2017	11:52:00 AM	25	44.1
23/06/2017	11:52:30 AM	26	53.8
23/06/2017	11:53:00 AM	27	42.7
23/06/2017	11:53:30 AM	28	45.6
23/06/2017	11:54:00 AM	29	41.5
23/06/2017	11:54:30 AM	30	44.2
23/06/2017	12:50:00 PM	31	45.2
23/06/2017	12:50:30 PM	32	53.3

Date	Time	Sample	Noise LA
23/06/2017	12:51:00 PM	33	43.5
23/06/2017	12:51:30 PM	34	46.3
23/06/2017	12:52:00 PM	35	42.5
23/06/2017	12:52:30 PM	36	47.0
23/06/2017	12:53:00 PM	37	38.8
23/06/2017	12:53:30 PM	38	48.4
23/06/2017	12:54:00 PM	39	39.9
23/06/2017	12:54:30 PM	40	48.2
23/06/2017	1:50:00 PM	41	79.1
23/06/2017	1:50:30 PM	42	83.4
23/06/2017	1:51:00 PM	43	75.9
23/06/2017	1:51:30 PM	44	84.3
23/06/2017	1:52:00 PM	45	68.9
23/06/2017	1:52:30 PM	46	77.3
23/06/2017	1:53:00 PM	47	69.1
23/06/2017	1:53:30 PM	48	72.2
23/06/2017	1:54:00 PM	49	67.4
23/06/2017	1:54:30 PM	50	72.2
23/06/2017	2:50:00 PM	51	41.3
23/06/2017	2:50:30 PM	52	52.7
23/06/2017	2:51:00 PM	53	41.7
23/06/2017	2:51:30 PM	54	52.0
23/06/2017	2:52:00 PM	55	42.2
23/06/2017	2:52:30 PM	56	52.9
23/06/2017	2:53:00 PM	57	43.2
23/06/2017	2:53:30 PM	58	49.7
23/06/2017	2:54:00 PM	59	42.7
23/06/2017	2:54:30 PM	60	50.5
23/06/2017	3:50:00 PM	61	43.7
23/06/2017	3:50:30 PM	62	57.1
23/06/2017	3:51:00 PM	63	43.9
23/06/2017	3:51:30 PM	64	51.7
23/06/2017	3:52:00 PM	65	44.4
23/06/2017	3:52:30 PM	66	57.0
23/06/2017	3:53:00 PM	67	46.0
23/06/2017	3:53:30 PM	68	50.3
23/06/2017	3:54:00 PM	69	44.0
23/06/2017	3:54:30 PM	70	56.6
23/06/2017	4:50:00 PM	71	47.8
23/06/2017	4:50:30 PM	72	52.1
23/06/2017	4:51:00 PM	73	47.7
23/06/2017	4:51:30 PM	74	58.7
23/06/2017	4:52:00 PM	75	47.6

Date	Time	Sample	Noise LA
23/06/2017	4:52:30 PM	76	48.8
23/06/2017	4:53:00 PM	77	48.3
23/06/2017	4:53:30 PM	78	60.8
23/06/2017	4:54:00 PM	79	48.2
23/06/2017	4:54:30 PM	80	68.5

Table 2.4: Bugolobi

Date	Time	Sample	Noise LA
24/06/2017	9:45:00 AM	1	57.9
24/06/2017	9:45:30 AM	2	62.0
24/06/2017	9:46:00 AM	3	52.6
24/06/2017	9:46:30 AM	4	67.5
24/06/2017	9:47:00 AM	5	58.5
24/06/2017	9:47:30 AM	6	67.5
24/06/2017	9:48:00 AM	7	54.0
24/06/2017	9:48:30 AM	8	68.5
24/06/2017	9:49:00 AM	9	52.1
24/06/2017	9:49:30 AM	10	68.6
24/06/2017	10:45:00 AM	11	53.3
24/06/2017	10:45:30 AM	12	74.9
24/06/2017	10:46:00 AM	13	51.5
24/06/2017	10:46:30 AM	14	66.7
24/06/2017	10:47:00 AM	15	53.8
24/06/2017	10:47:30 AM	16	60.5
24/06/2017	10:48:00 AM	17	49.7
24/06/2017	10:48:30 AM	18	58.8
24/06/2017	10:49:00 AM	19	49.5
24/06/2017	10:49:30 AM	20	61.0
24/06/2017	11:45:00 AM	21	51.4
24/06/2017	11:45:30 AM	22	66.8
24/06/2017	11:46:00 AM	23	51.3
24/06/2017	11:46:30 AM	24	73.0
24/06/2017	11:47:00 AM	25	53.6
24/06/2017	11:47:30 AM	26	86.3
24/06/2017	11:48:00 AM	27	52.2
24/06/2017	11:48:30 AM	28	86.1
24/06/2017	11:49:00 AM	29	50.2
24/06/2017	11:49:30 AM	30	72.8
24/06/2017	12:45:00 PM	31	51.9
24/06/2017	12:45:30 PM	32	66.3
24/06/2017	12:46:00 PM	33	48.0
24/06/2017	12:46:30 PM	34	65.0

Date	Time	Sample	Noise LA
24/06/2017	12:47:00 PM	35	58.1
24/06/2017	12:47:30 PM	36	69.8
24/06/2017	12:48:00 PM	37	51.3
24/06/2017	12:48:30 PM	38	67.1
24/06/2017	12:49:00 PM	39	57.5
24/06/2017	12:49:30 PM	40	66.5
24/06/2017	1:45:00 PM	41	50.9
24/06/2017	1:45:30 PM	42	66.7
24/06/2017	1:46:00 PM	43	51.7
24/06/2017	1:46:30 PM	44	60.6
24/06/2017	1:47:00 PM	45	50.7
24/06/2017	1:47:30 PM	46	64.3
24/06/2017	1:48:00 PM	47	52.2
24/06/2017	1:48:30 PM	48	63.6
24/06/2017	1:49:00 PM	49	58.3
24/06/2017	1:49:30 PM	50	72.2
24/06/2017	2:45:00 PM	51	50.3
24/06/2017	2:45:30 PM	52	61.7
24/06/2017	2:46:00 PM	53	54.6
24/06/2017	2:46:30 PM	54	62.0
24/06/2017	2:47:00 PM	55	51.7
24/06/2017	2:47:30 PM	56	59.0
24/06/2017	2:48:00 PM	57	57.3
24/06/2017	2:48:30 PM	58	66.6
24/06/2017	2:49:00 PM	59	51.2
24/06/2017	2:49:30 PM	60	57.5
24/06/2017	3:45:00 PM	61	56.1
24/06/2017	3:45:30 PM	62	70.2
24/06/2017	3:46:00 PM	63	49.1
24/06/2017	3:46:30 PM	64	77.5
24/06/2017	3:47:00 PM	65	49.5
24/06/2017	3:47:30 PM	66	69.3
24/06/2017	3:48:00 PM	67	53.6
24/06/2017	3:48:30 PM	68	62.9
24/06/2017	3:49:00 PM	69	52.1
24/06/2017	3:49:30 PM	70	66.7
24/06/2017	4:45:00 PM	71	51.5
24/06/2017	4:45:30 PM	72	69.0
24/06/2017	4:46:00 PM	73	50.4
24/06/2017	4:46:30 PM	74	67.5
24/06/2017	4:47:00 PM	75	50.5
24/06/2017	4:47:30 PM	76	60.5
24/06/2017	4:48:00 PM	77	48.1

Date	Time	Sample	Noise LA
24/06/2017	4:48:30 PM	78	66.5
24/06/2017	4:49:00 PM	79	50.5
24/06/2017	4:49:30 PM	80	56.7

Table 2.5: Kyeitabya Bukasa

Date	Time	Sample	Noise LA
26/06/2017	10:30:00 AM	1	53.3
26/06/2017	10:30:30 AM	2	57.1
26/06/2017	10:31:00 AM	3	47.6
26/06/2017	10:31:30 AM	4	59.3
26/06/2017	10:32:00 AM	5	46.4
26/06/2017	10:32:30 AM	6	71.6
26/06/2017	10:33:00 AM	7	50.3
26/06/2017	10:33:30 AM	8	68.3
26/06/2017	10:34:00 AM	9	49.0
26/06/2017	10:34:30 AM	10	52.6
26/06/2017	11:30:00 AM	11	50.5
26/06/2017	11:30:30 AM	12	52.8
26/06/2017	11:31:00 AM	13	49.4
26/06/2017	11:31:30 AM	14	51.8
26/06/2017	11:32:00 AM	15	50.3
26/06/2017	11:32:30 AM	16	52.3
26/06/2017	11:33:00 AM	17	51.5
26/06/2017	11:33:30 AM	18	52.6
26/06/2017	11:34:00 AM	19	50.7
26/06/2017	11:34:30 AM	20	52.1
26/06/2017	12:30:00 PM	21	39.8
26/06/2017	12:30:30 PM	22	45.8
26/06/2017	12:31:00 PM	23	42.9
26/06/2017	12:31:30 PM	24	47.5
26/06/2017	12:32:00 PM	25	38.5
26/06/2017	12:32:30 PM	26	46.6
26/06/2017	12:33:00 PM	27	39.2
26/06/2017	12:33:30 PM	28	46.2
26/06/2017	12:34:00 PM	29	39.6
26/06/2017	12:34:30 PM	30	49.2
26/06/2017	1:30:00 PM	31	38.6
26/06/2017	1:30:30 PM	32	48.7
26/06/2017	1:31:00 PM	33	37.3
26/06/2017	1:31:30 PM	34	48.5
26/06/2017	1:32:00 PM	35	36.5
26/06/2017	1:32:30 PM	36	41.2

Date	Time	Sample	Noise LA
26/06/2017	1:33:00 PM	37	37.3
26/06/2017	1:33:30 PM	38	44.3
26/06/2017	1:34:00 PM	39	38.2
26/06/2017	1:34:30 PM	40	43.5
26/06/2017	2:30:00 PM	41	38.7
26/06/2017	2:30:30 PM	42	52.5
26/06/2017	2:31:00 PM	43	39.2
26/06/2017	2:31:30 PM	44	49.5
26/06/2017	2:32:00 PM	45	39.4
26/06/2017	2:32:30 PM	46	50.7
26/06/2017	2:33:00 PM	47	46.8
26/06/2017	2:33:30 PM	48	52.3
26/06/2017	2:34:00 PM	49	38.3
26/06/2017	2:34:30 PM	50	48.1
26/06/2017	3:30:00 PM	51	40.3
26/06/2017	3:30:30 PM	52	56.4
26/06/2017	3:31:00 PM	53	40.9
26/06/2017	3:31:30 PM	54	54.4
26/06/2017	3:32:00 PM	55	38.5
26/06/2017	3:32:30 PM	56	57.9
26/06/2017	3:33:00 PM	57	44.4
26/06/2017	3:33:30 PM	58	48.5
26/06/2017	3:34:00 PM	59	41.8
26/06/2017	3:34:30 PM	60	56.1
26/06/2017	4:30:00 PM	61	48.4
26/06/2017	4:30:30 PM	62	57.5
26/06/2017	4:31:00 PM	63	40.1
26/06/2017	4:31:30 PM	64	52.9
26/06/2017	4:32:00 PM	65	52.8
26/06/2017	4:32:30 PM	66	66.7
26/06/2017	4:33:00 PM	67	43.5
26/06/2017	4:33:30 PM	68	51.9
26/06/2017	4:34:00 PM	69	40.5
26/06/2017	4:34:30 PM	70	55.7
26/06/2017	5:30:00 PM	71	44.9
26/06/2017	5:30:30 PM	72	58.5
26/06/2017	5:31:00 PM	73	48.0
26/06/2017	5:31:30 PM	74	59.3
26/06/2017	5:32:00 PM	75	39.3
26/06/2017	5:32:30 PM	76	54.3
26/06/2017	5:33:00 PM	77	46.7
26/06/2017	5:33:30 PM	78	63.0
26/06/2017	5:34:00 PM	79	40.1

Date	Time	Sample	Noise LA
26/06/2017	5:34:30 PM	80	56.6

Table 2.6: Kulenkana-Salama Rd

Date	Time	Sample	Noise LA
27/06/2017	9:40:00 AM	1	63.0
27/06/2017	9:40:30 AM	2	82.7
27/06/2017	9:41:00 AM	3	60.4
27/06/2017	9:41:30 AM	4	69.1
27/06/2017	9:42:00 AM	5	59.2
27/06/2017	9:42:30 AM	6	69.3
27/06/2017	9:43:00 AM	7	65.3
27/06/2017	9:43:30 AM	8	73.6
27/06/2017	9:44:00 AM	9	60.8
27/06/2017	9:44:30 AM	10	74.1
27/06/2017	10:40:00 AM	11	65.0
27/06/2017	10:40:30 AM	12	75.6
27/06/2017	10:41:00 AM	13	68.6
27/06/2017	10:41:30 AM	14	80.8
27/06/2017	10:42:00 AM	15	63.0
27/06/2017	10:42:30 AM	16	79.0
27/06/2017	10:43:00 AM	17	63.6
27/06/2017	10:43:30 AM	18	81.8
27/06/2017	10:44:00 AM	19	60.7
27/06/2017	10:44:30 AM	20	71.0
27/06/2017	11:40:00 AM	21	56.7
27/06/2017	11:40:30 AM	22	65.2
27/06/2017	11:41:00 AM	23	62.4
27/06/2017	11:41:30 AM	24	69.6
27/06/2017	11:42:00 AM	25	59.7
27/06/2017	11:42:30 AM	26	71.2
27/06/2017	11:43:00 AM	27	66.5
27/06/2017	11:43:30 AM	28	75.9
27/06/2017	11:44:00 AM	29	61.8
27/06/2017	11:44:30 AM	30	70.8
27/06/2017	12:40:00 PM	31	60.6
27/06/2017	12:40:30 PM	32	75.3
27/06/2017	12:41:00 PM	33	59.0
27/06/2017	12:41:30 PM	34	71.4
27/06/2017	12:42:00 PM	35	58.8
27/06/2017	12:42:30 PM	36	77.8
27/06/2017	12:43:00 PM	37	64.0
27/06/2017	12:43:30 PM	38	71.1

Date	Time	Sample	Noise LA
27/06/2017	12:44:00 PM	39	63.0
27/06/2017	12:44:30 PM	40	74.7
27/06/2017	1:40:00 PM	41	56.2
27/06/2017	1:40:30 PM	42	75.7
27/06/2017	1:41:00 PM	43	63.0
27/06/2017	1:41:30 PM	44	77.5
27/06/2017	1:42:00 PM	45	59.1
27/06/2017	1:42:30 PM	46	68.6
27/06/2017	1:43:00 PM	47	64.0
27/06/2017	1:43:30 PM	48	77.3
27/06/2017	1:44:00 PM	49	69.6
27/06/2017	1:44:30 PM	50	77.7
27/06/2017	2:40:00 PM	51	58.6
27/06/2017	2:40:30 PM	52	75.2
27/06/2017	2:41:00 PM	53	64.6
27/06/2017	2:41:30 PM	54	69.3
27/06/2017	2:42:00 PM	55	55.0
27/06/2017	2:42:30 PM	56	77.8
27/06/2017	2:43:00 PM	57	58.3
27/06/2017	2:43:30 PM	58	75.9
27/06/2017	2:44:00 PM	59	58.1
27/06/2017	2:44:30 PM	60	71.4
27/06/2017	3:40:00 PM	61	58.5
27/06/2017	3:40:30 PM	62	72.6
27/06/2017	3:41:00 PM	63	55.5
27/06/2017	3:41:30 PM	64	73.0
27/06/2017	3:42:00 PM	65	60.5
27/06/2017	3:42:30 PM	66	72.5
27/06/2017	3:43:00 PM	67	56.6
27/06/2017	3:43:30 PM	68	72.1
27/06/2017	3:44:00 PM	69	59.5
27/06/2017	3:44:30 PM	70	80.8
27/06/2017	4:40:00 PM	71	58.3
27/06/2017	4:40:30 PM	72	73.2
27/06/2017	4:41:00 PM	73	56.9
27/06/2017	4:41:30 PM	74	77.8
27/06/2017	4:42:00 PM	75	64.8
27/06/2017	4:42:30 PM	76	74.5
27/06/2017	4:43:00 PM	77	59.7
27/06/2017	4:43:30 PM	78	74.5
27/06/2017	4:44:00 PM	79	63.9
27/06/2017	4:44:30 PM	80	74.6

ICS 2013

Raw data for the study was not made available to Earth Systems. As such a summary of the data is presented below.

Table 3: Noise monitoring results for Kampala Southern Bypass route in 2013 (ICS 2015)

	Location Description	Northing	Easting	Leq dB(A)		Max dB(A)
1	Currently a dump site	460507	36336	53	51	65
2	Currently a market	459771	35855	58	64	n/a
3	Primary School	459744	35725	44	54	57
4	Current road crossing	459533	35472	48	51	57
5	Current road crossing	459367	35419	57	59	67
6	Next to active road	458927	35340	71	68	n/a
7	Prison area for women	459283	33430	59	63	n/a
8	Luzira industrial area	459020	33607	45	47	52
9	Railway sugar cane	458442	33255	45	44	67
10	Tunnel start, swamp	458706	32695	44	48	60
11	Muyenga at swamp	459243	32096	45	44	54
12	Bukasa Primary School	458581	31733	45	45	55
13	Gaba road entry	456904	31134	54	59	82
14	St Dennis Church	455920	30728	53	56	64
15	Road crossing	455984	30687	68	65	66
16	Tunnel entry	455712	30398	49	47	73
17	Nakinyuguzi High School	455547	30245	43	47	51
18	Entry to Salama Road	455171	29407	44	54	80
19	Near St Posiano church	455849	28573	58	59	60
20	Model High School Salama	455944	28301	47	49	60
21	Heaven Alter Church	456154	27380	43	45	51
			Leq	**60.3**	**59.3**	**82 max**

JICA / UNRA 2013

As raw data was not provided to Earth Systems, a summary of the data collected by JICA / UNRA 2013 is presented below.

Table 4: Noise monitoring results in Kampala in 2013 (UNRA 2014)

Location Description	Day-time Leq dB(A)			Night-time Leq dB(A)	
	6am – 9am	9am – 12pm	12pm – 3pm	6pm – 10 pm	10 pm – 1am
Clock Tower Junction	75	80	81	77	55
Between Entebbe Road and Railway	76	82	82	72	59
In front of Police Quarters	50	77	69	71	41
Nakumat Junction	57	73	78	72	59
Hotel Africana Junction	58	74	77	74	49
WHO Guideline	**55**			**45**	
Uganda Guideline	**60**			**50**	

Vibration Data

Table 5: Vibration Data

Site	RMS			Min m/s^2			Max m/s^2			Mean		
	X	Y	Z	X	Y	Z	X	Y	Z	RMS	Min	Max
Hilton High	0.040	0.044	0.044	-0.155	-0.172	-0.175	0.161	0.175	0.168	0.034	-0.202	0.217
	0.040	0.043	0.043	-0.143	-0.192	-0.176	0.165	0.190	0.169			
	0.018	0.018	0.020	-0.069	-0.077	-0.081	0.080	0.075	0.077			
	0.043	0.044	0.044	-0.131	-0.190	-0.156	0.181	0.196	0.161			
	0.032	0.044	0.044	-0.153	-0.192	-0.202	0.121	0.201	0.217			
	0.018	0.018	0.021	-0.076	-0.076	-0.085	0.079	0.083	0.071			
Kyawambogo	0.019	0.020	0.021	-0.073	-0.088	-0.098	0.085	0.068	0.094	0.039	-0.190	0.211
	0.040	0.043	0.043	-0.144	-0.187	-0.140	0.175	0.164	0.211			
	0.040	0.044	0.044	-0.155	-0.162	-0.180	0.169	0.183	0.169			
	0.036	0.048	0.045	-0.129	-0.180	-0.158	0.194	0.209	0.173			
	0.037	0.044	0.044	-0.132	-0.173	-0.179	0.172	0.182	0.172			
	0.043	0.044	0.044	-0.138	-0.190	-0.180	0.138	0.196	0.175			
Ssezibwa Falls	0.041	0.046	0.044	-0.177	-0.150	-0.201	0.162	0.163	0.186	0.038	-0.201	0.197
	0.039	0.043	0.044	-0.125	-0.191	-0.159	0.181	0.193	0.152			
	0.012	0.019	0.021	-0.043	-0.082	-0.093	0.036	0.076	0.069			
	0.032	0.045	0.044	-0.121	-0.187	-0.180	0.152	0.165	0.170			
	0.039	0.044	0.044	-0.173	-0.186	-0.198	0.174	0.162	0.185			
	0.040	0.045	0.045	-0.184	-0.190	-0.158	0.173	0.196	0.197			