

August 7, 2014

Resource West
2323 Logos Drive
Grand Junction, CO 81505

Attention: John Baker, Production Manager

Subject: Land Shark Evaporation Unit Noise Modeling Report

Dear Mr. Baker:

The following report describes the development of noise models representing the Land Shark Evaporation Unit. The noise modeling includes both unmitigated and mitigated scenarios.

Sound Level Survey

Noise level measurements for the Land Shark Evaporation Unit were obtained on Wednesday, June 18, 2014. Measurements were taken adjacent to and at increasing distances from the noise emitting unit while it was operational on-site, with and without water running. Measurements of this equipment were conducted with a Brüel & Kjær Type 1 Model 2250 Sound Level Meter.

Noise Modeling

The noise model was created using SoundPlan 7.3 software which calculates noise levels in accordance with ISO 9613 standards. This noise model predicts noise levels based on the locations, noise levels and frequency spectra of the noise sources, and the geometry and reflective properties of the local terrain, buildings and barriers.

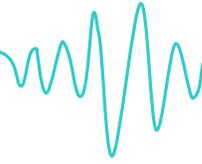
The units were modeled unmitigated, dry and with water running. A 12 ft high temporary acoustical perimeter panel with a Sound Transmission Class (STC) rating of 25 was added approximately 10 ft from the unit. The unit was then modeled as mitigated, dry and with water running.

Results

Noise contour maps are provided to show the results of the noise modeling for the evaporation unit. The maps contain contours provided in 5 dB increments. A color scale is provided on the right of the maps indicating the overall sound level of each contour. The sound levels are reported using both the A-weighted (dBA) and C-weighted decibel scale (dBC) and represent only the noise generated by the evaporation unit. Field sound level measurements may vary due

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Resource West Land Shark
August 7, 2014
Page 2

to the effects of other human activity or environmental factors not included in the noise modeling.

Noise levels vs distance charts are provided showing the noise level at increasing distances from the unit for the modeled unmitigated scenarios. The thickness of each curve represents the difference between the minimum and maximum noise levels.

Attachments are as follows:

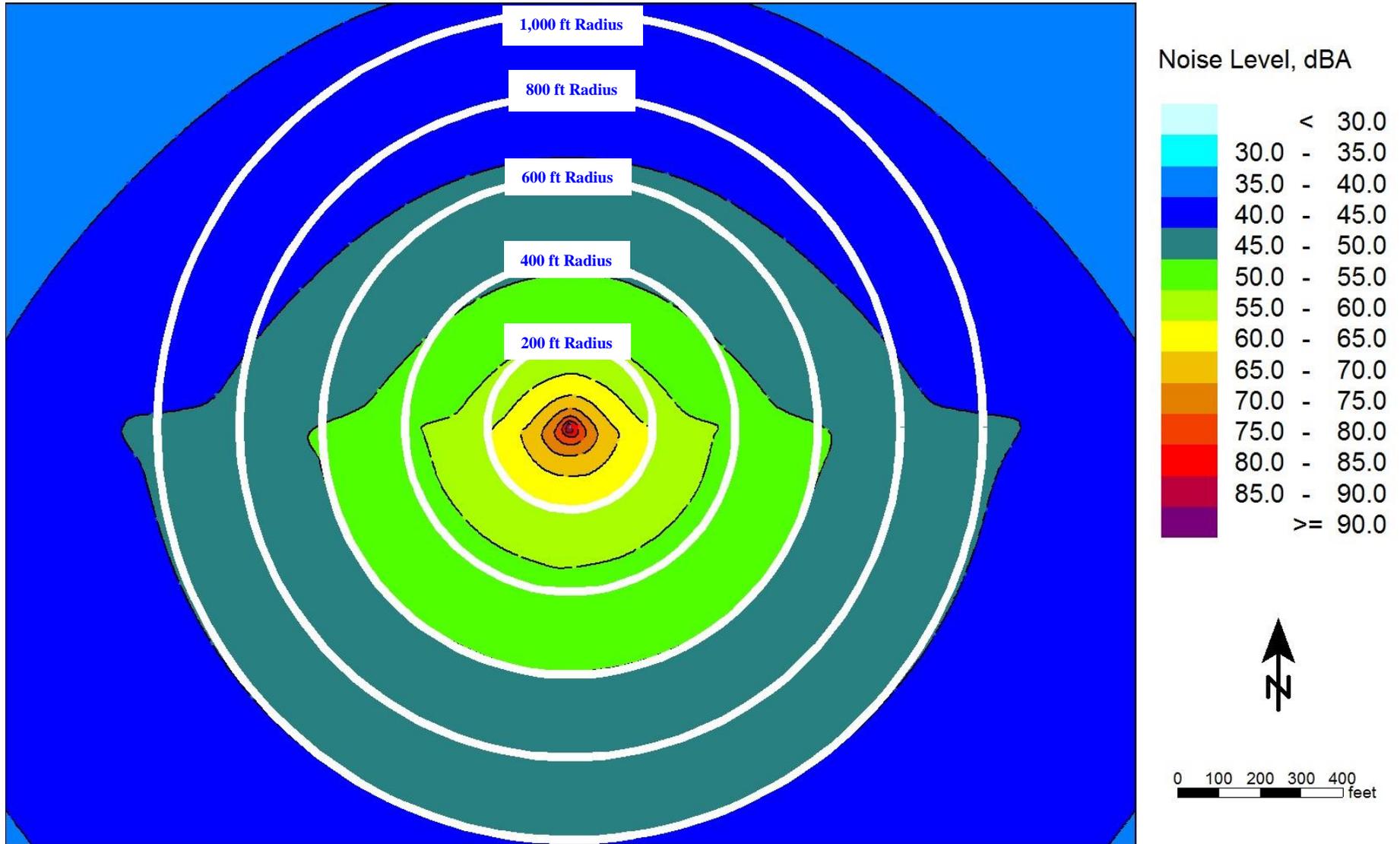
- Attachment 1: Unmitigated (Running Dry) Noise Contour Map (dBA)
- Attachment 2: Unmitigated (Running Dry) Noise Contour Map (dBC)
- Attachment 3: Unmitigated (Water Running) Noise Contour Map (dBA)
- Attachment 4: Unmitigated (Water Running) Noise Contour Map (dBC)
- Attachment 5: Mitigated (Running Dry) Noise Contour Map (dBA)
- Attachment 6: Mitigated (Running Dry) Noise Contour Map (dBC)
- Attachment 7: Mitigated (Water Running) Noise Contour Map (dBA)
- Attachment 8: Mitigated (Water Running) Noise Contour Map (dBC)
- Attachment 9: Noise Level vs Distance Curves (dBA)
- Attachment 10: Noise Level vs Distance Curves (dBC)
- Attachments 11 & 12: Land Shark Noise Levels

Please contact me with any questions or comments.

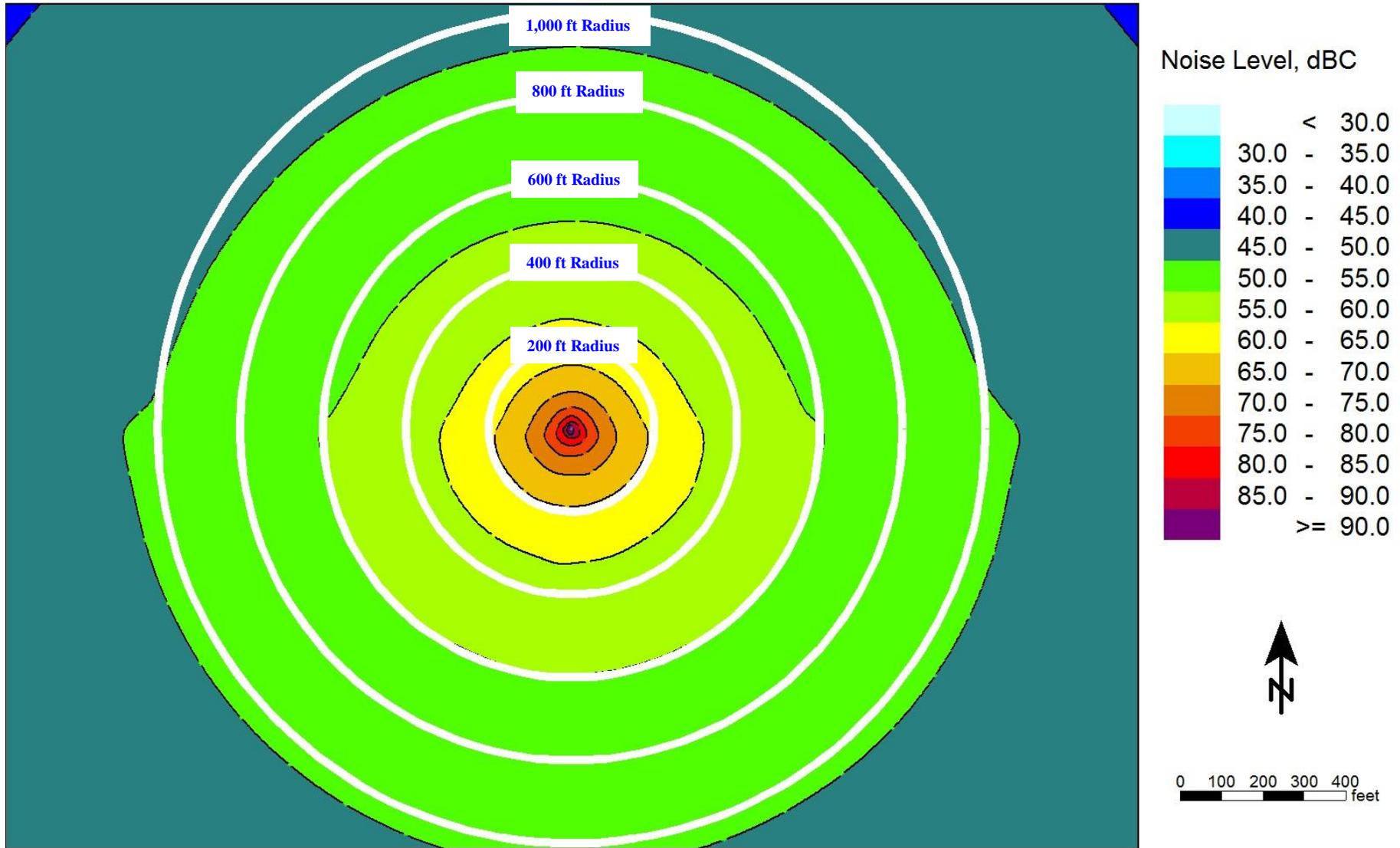
Very truly yours,

Deborah M Talarico
Acoustical Consultant

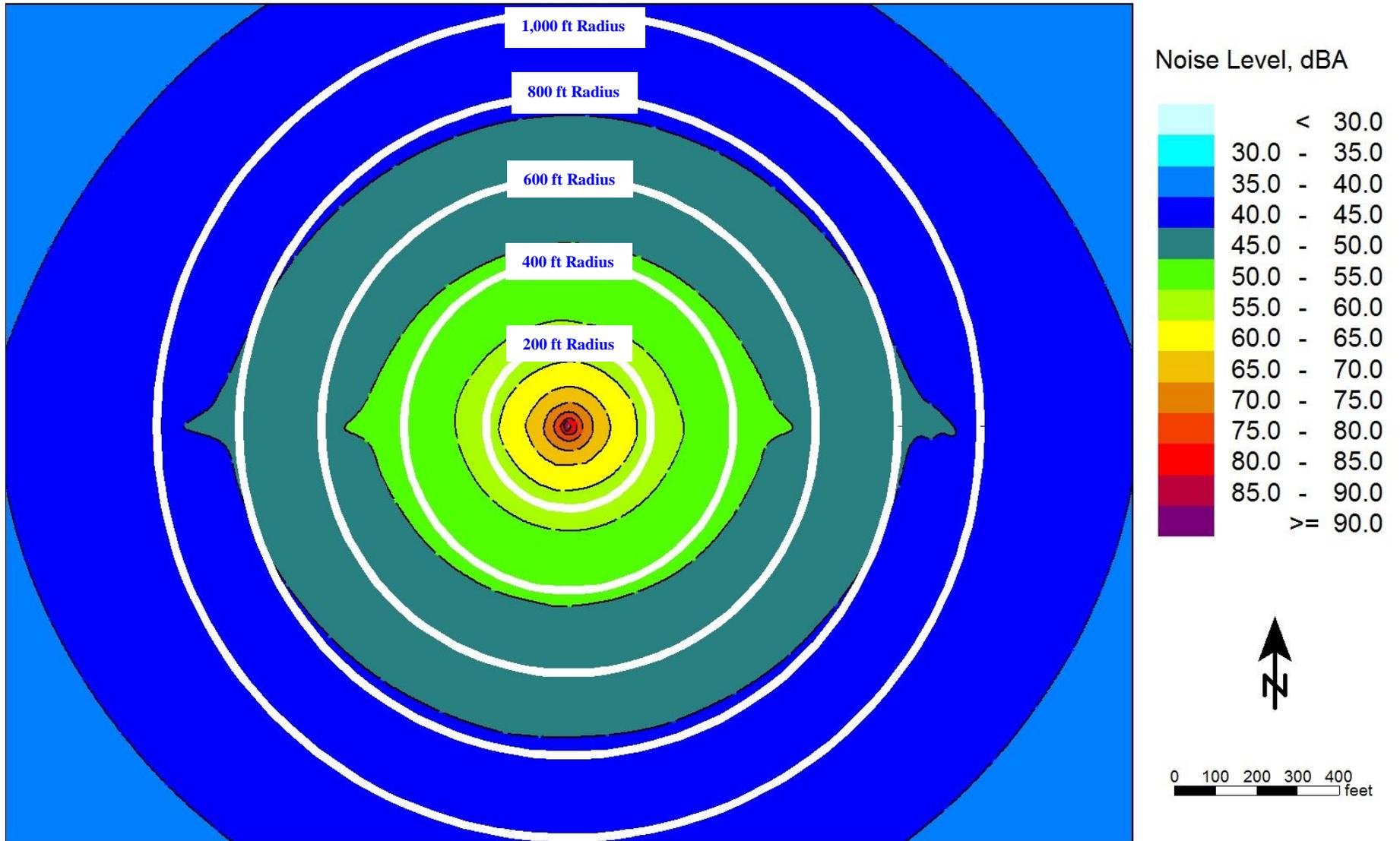
Attachments



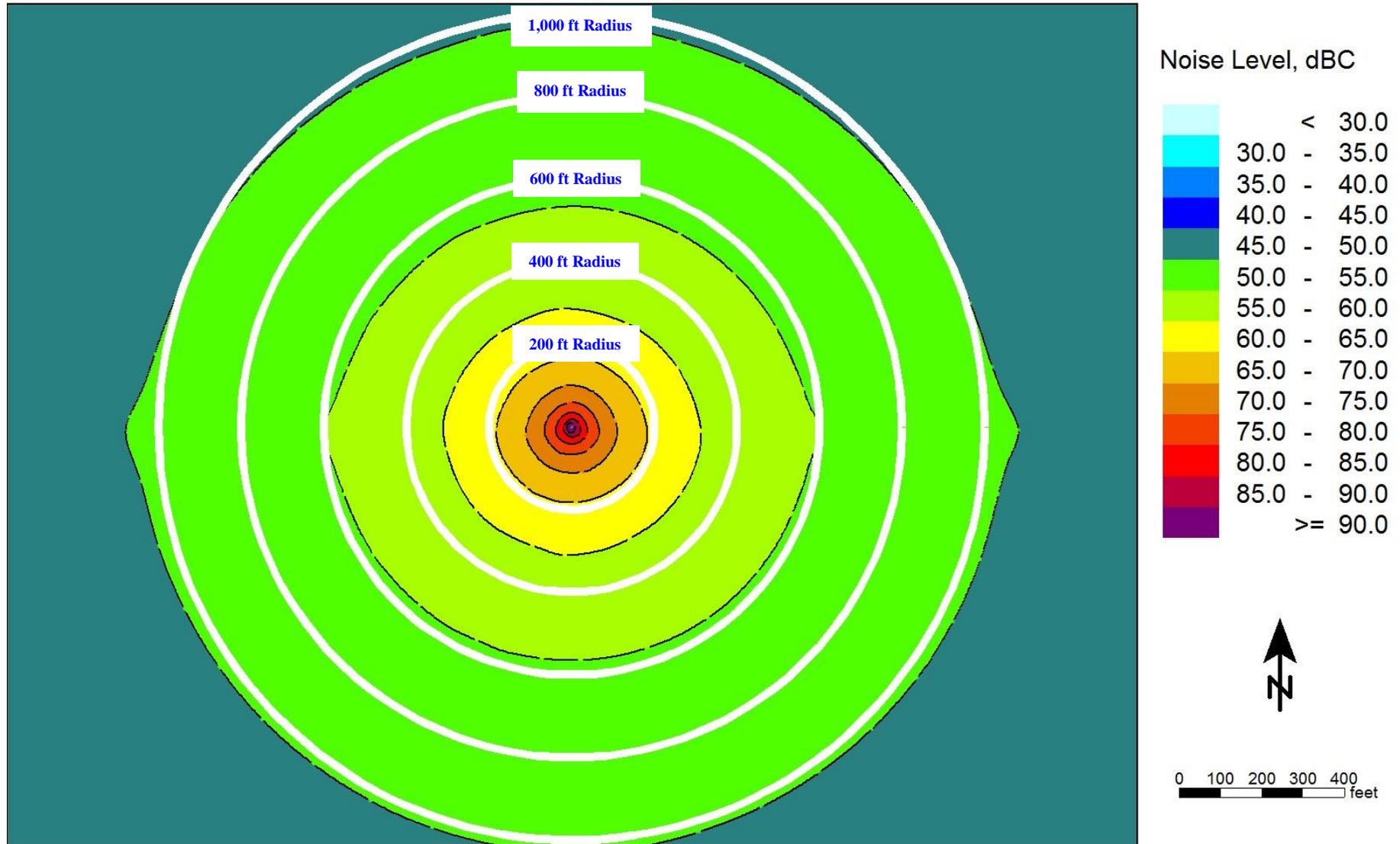
Attachment 1
Unmitigated (Running Dry) Noise Contour Map (dBA)



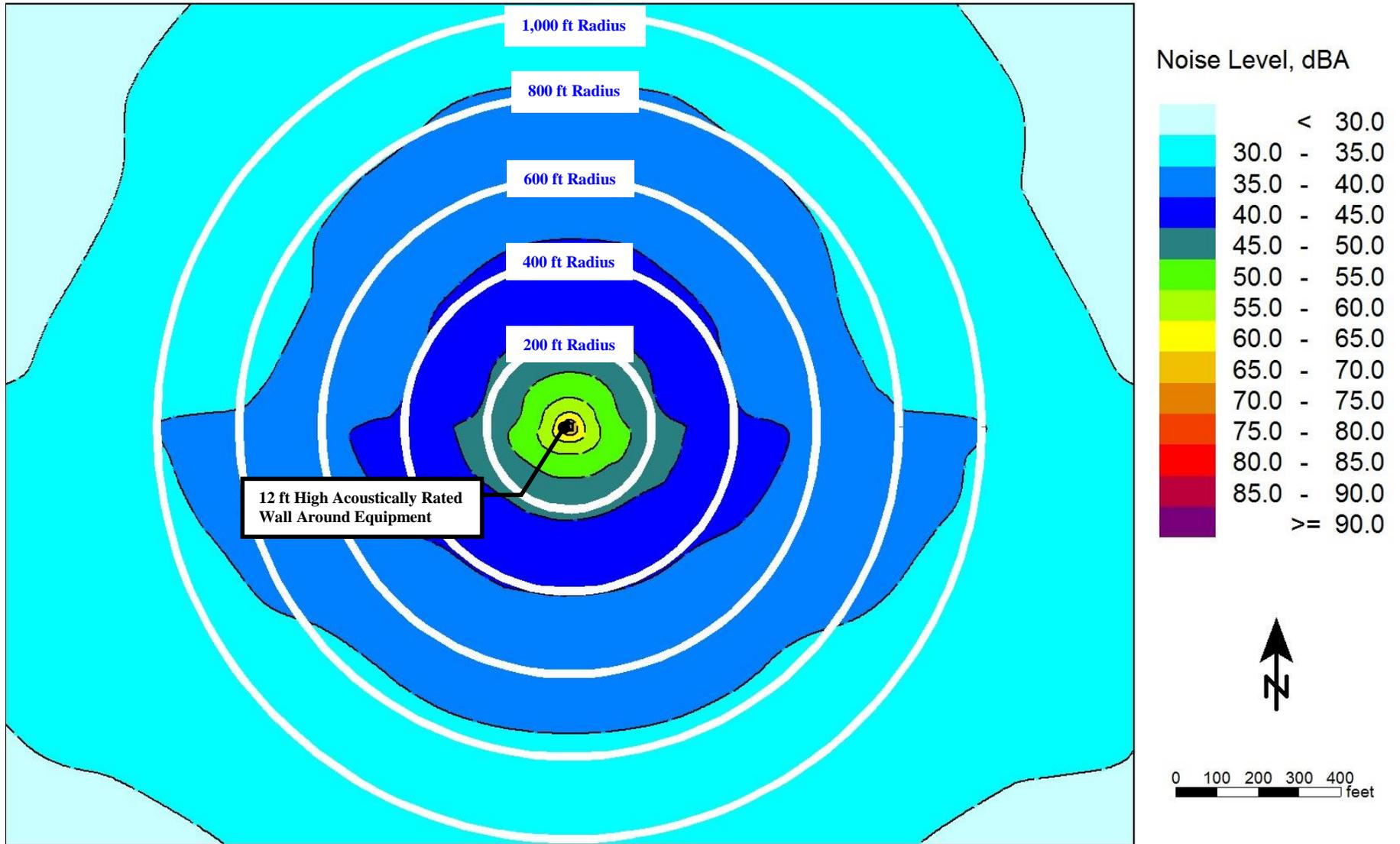
Attachment 2
Unmitigated (Running Dry) Noise Contour Map (dBC)



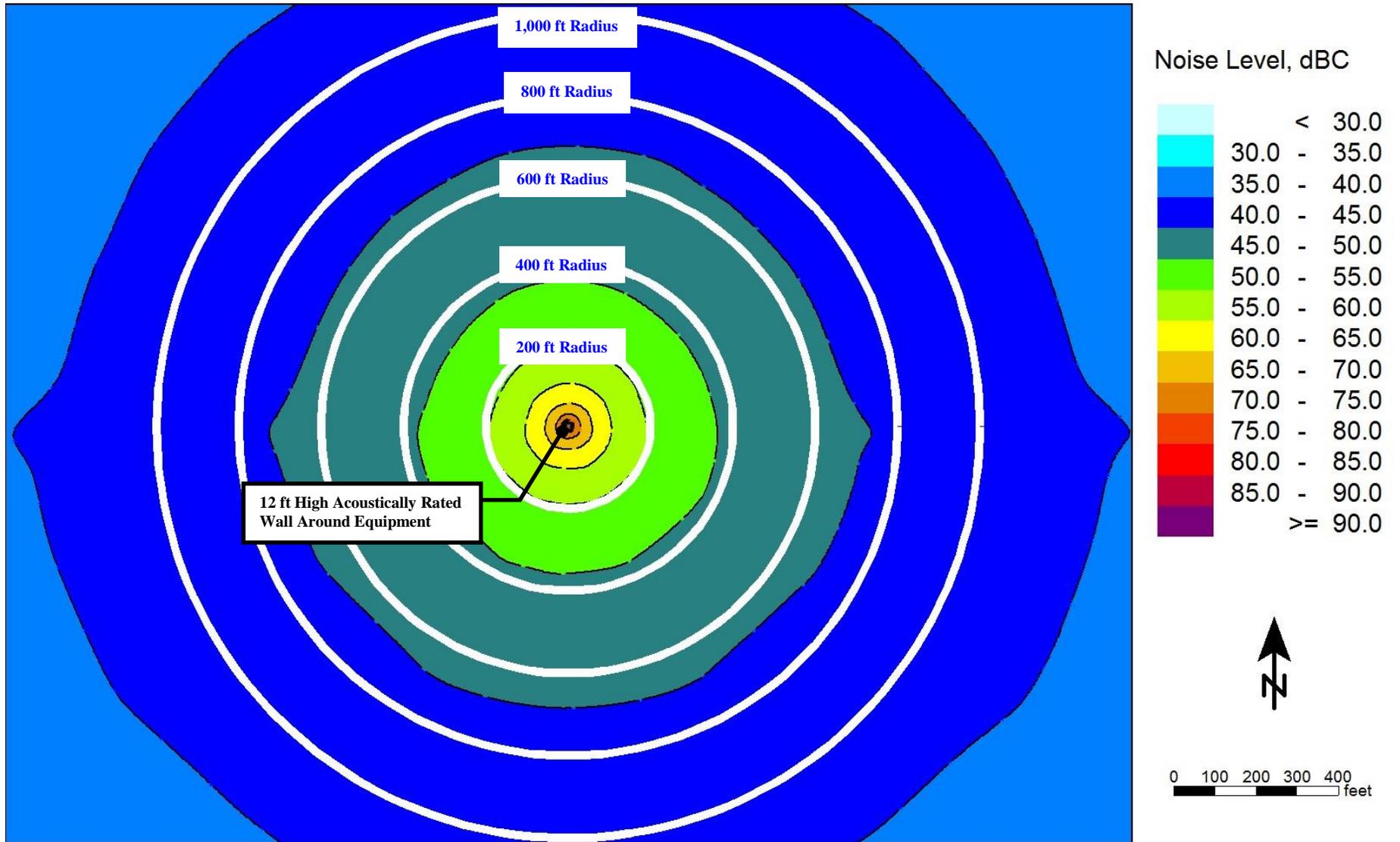
Attachment 3
Unmitigated (Water Running) Noise Contour Map (dBA)



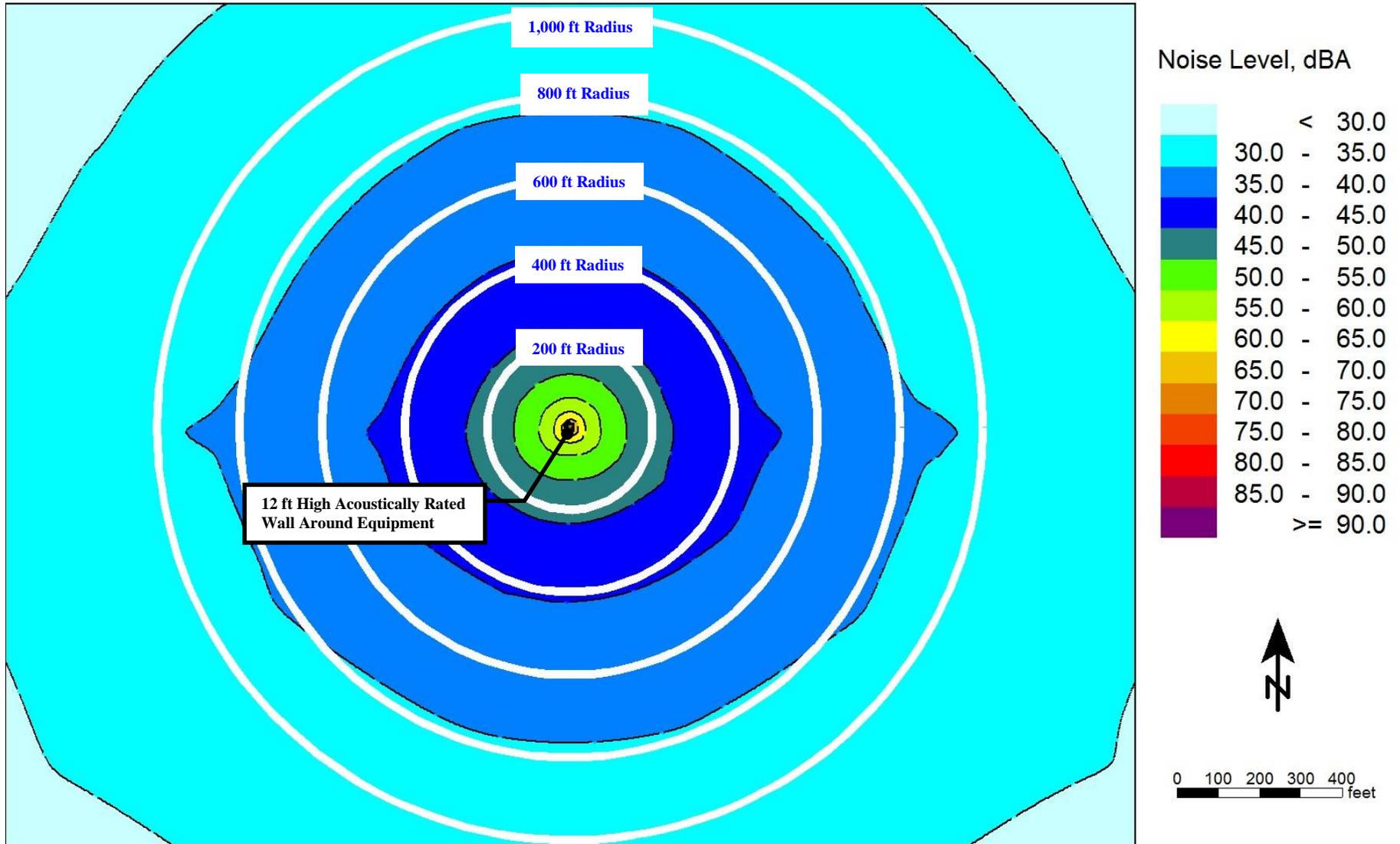
Attachment 4
Unmitigated (Water Running) Noise Contour Map (dBC)



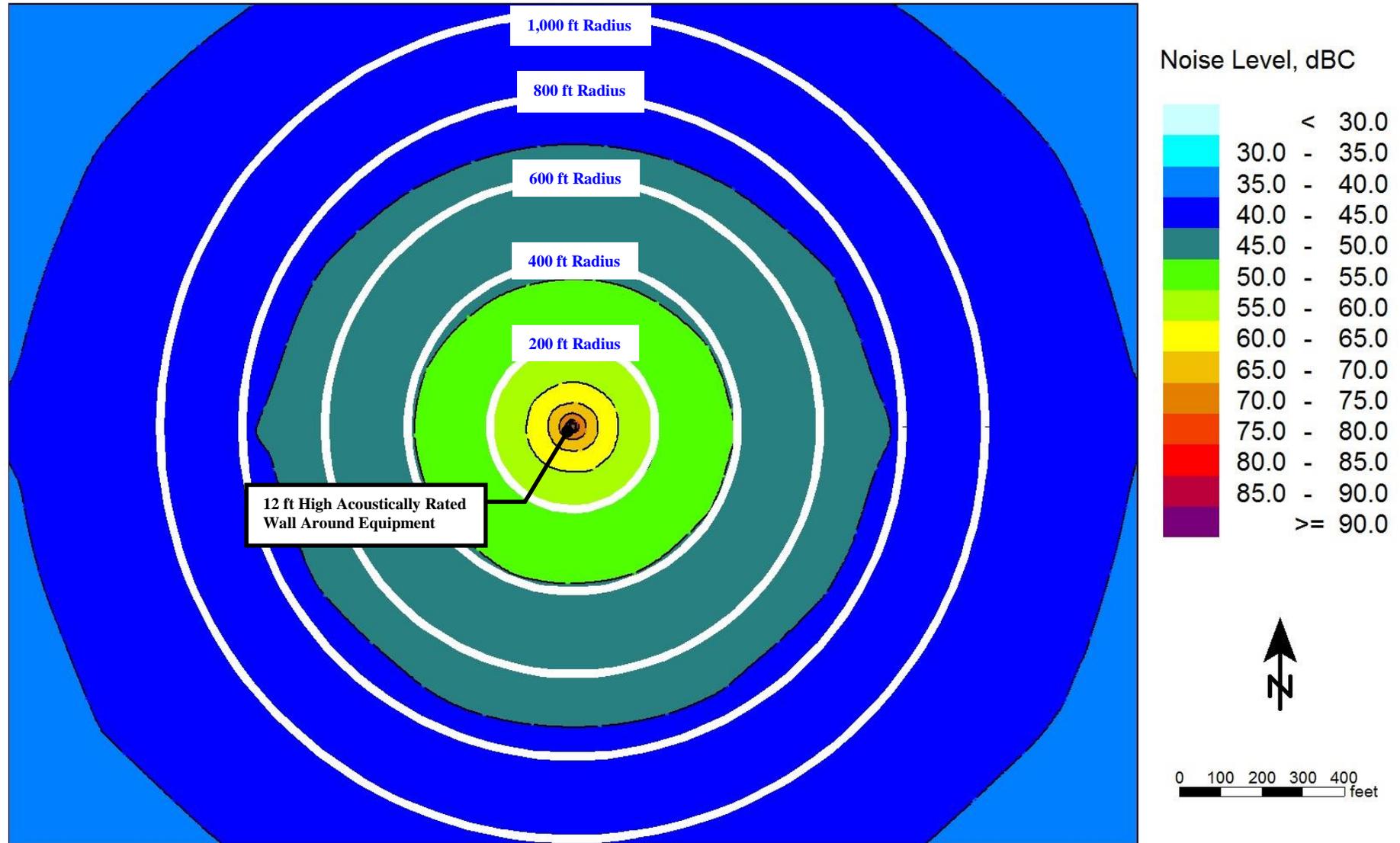
Attachment 5
Mitigated (Running Dry) Noise Contour Map (dBA)



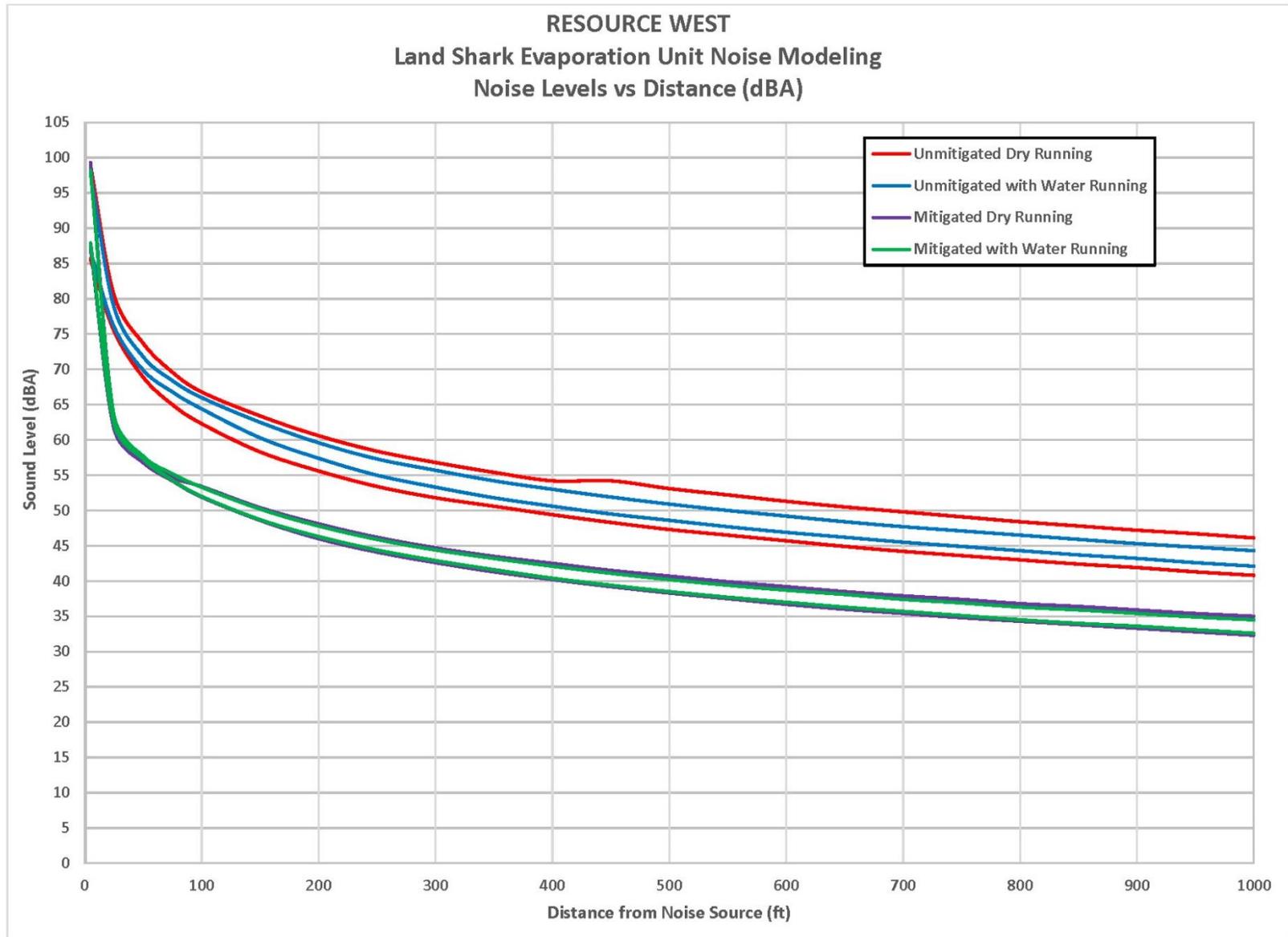
**Attachment 6
Mitigated (Running Dry) Noise Contour Map (dBC)**

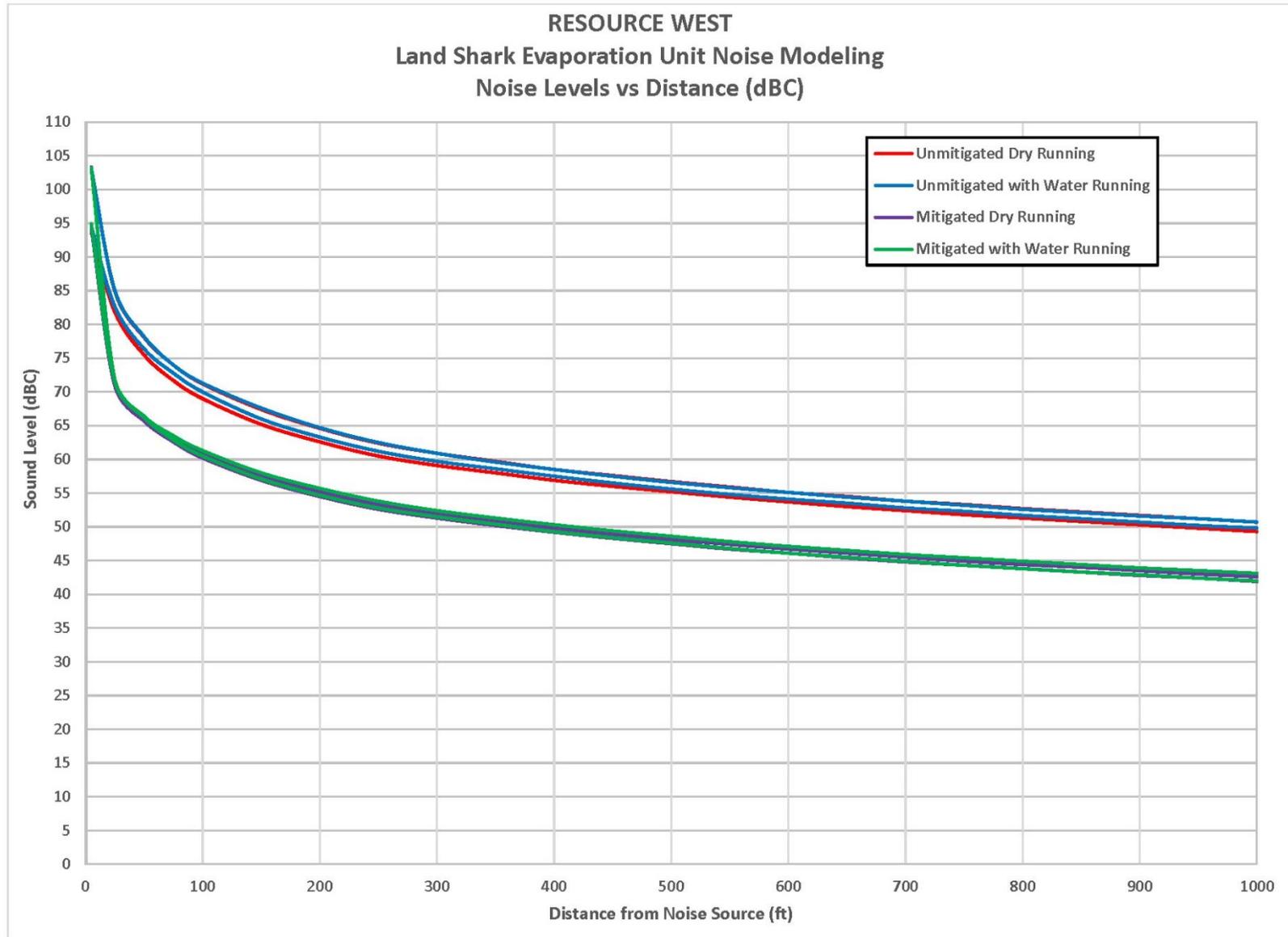


Attachment 7
Mitigated (Water Running) Noise Contour Map (dBA)



Attachment 8
Mitigated (Water Running) Noise Contour Map (dBC)





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Table 1 - Scenario 1: Unmitigated Noise Levels at Distance								
Running Dry								
Dist (ft)	East (dBA)	North (dBA)	West (dBA)	South (dBA)	East (dBC)	North (dBC)	West (dBC)	South (dBC)
5	85.6	94.6	86.2	98.9	93.7	100.4	94.1	103.1
25	76.2	75.5	76.3	80.6	82.2	81.9	82.3	85.0
50	70.2	68.9	70.5	73.7	76.1	75.5	76.2	78.1
75	68.2	65.0	67.7	69.6	73.1	71.7	72.9	74.0
100	66.2	62.3	66.0	66.8	70.8	69.0	70.8	71.2
150	63.4	58.3	63.4	62.9	67.4	65.2	67.4	67.3
200	60.4	55.6	60.6	59.9	64.6	62.6	64.6	64.3
250	58.4	53.4	58.4	57.6	62.4	60.5	62.4	62.1
300	56.8	51.8	56.8	55.9	60.9	59.1	60.9	60.6
350	55.4	50.6	55.1	54.6	59.7	58.0	59.6	59.3
400	54.2	49.4	54.2	53.4	58.5	56.9	58.5	58.2
450	53.1	48.3	53.2	52.3	57.6	56.0	57.6	57.2
500	52.2	47.3	52.2	51.3	56.7	55.2	56.7	56.4
550	51.3	46.5	51.3	50.5	55.9	54.4	55.9	55.6
600	50.5	45.7	50.5	49.7	55.1	53.7	55.1	54.8
650	49.8	44.9	49.8	48.9	54.5	53.0	54.5	54.2
700	49.1	44.2	49.1	48.2	53.8	52.4	53.8	53.5
750	48.4	43.6	48.4	47.6	53.2	51.8	53.3	52.9
800	47.8	43.0	47.8	47.0	52.7	51.3	52.7	52.4
850	47.2	42.4	47.3	46.4	52.2	50.8	52.2	51.9
900	46.7	41.9	46.7	45.8	51.7	50.3	51.7	51.4
950	46.1	41.3	46.1	45.3	51.2	49.8	51.2	50.9
1000	45.6	40.8	45.6	44.8	50.7	49.3	50.7	50.4

Table 2 - Scenario 2: Unmitigated Noise Levels at Distance								
with Water Running								
Dist (ft)	East (dBA)	North (dBA)	West (dBA)	South (dBA)	East (dBC)	North (dBC)	West (dBC)	South (dBC)
5	86.7	97.9	86.8	97.4	94.5	102.9	94.7	103.1
25	76.1	78.2	76.1	78.9	82.7	83.5	82.7	85.1
50	69.9	71.3	70.0	71.8	76.4	76.7	76.6	78.2
75	68.4	67.3	66.8	67.6	73.7	72.8	73.2	74.0
100	66.0	64.4	64.7	64.7	71.3	70.0	70.9	71.1
150	62.5	60.3	62.5	60.6	67.6	66.0	67.6	67.1
200	59.5	57.5	59.6	57.4	64.7	63.3	64.7	64.0
250	57.3	55.2	57.3	55.0	62.5	61.2	62.5	61.8
300	55.6	53.6	55.7	53.3	60.9	59.7	60.9	60.2
350	54.2	52.2	54.1	51.8	59.6	58.6	59.6	58.9
400	53.0	51.0	53.0	50.6	58.5	57.5	58.5	57.8
450	51.9	49.8	51.9	49.5	57.5	56.5	57.5	56.9
500	50.9	48.8	50.9	48.6	56.6	55.6	56.6	56.0
550	50.0	47.9	50.0	47.7	55.8	54.8	55.8	55.2
600	49.2	47.1	49.2	46.9	55.1	54.1	55.1	54.5
650	48.4	46.3	48.4	46.2	54.4	53.5	54.4	53.8
700	47.7	45.6	47.7	45.5	53.8	52.8	53.8	53.2
750	47.1	44.9	47.1	44.9	53.2	52.3	53.2	52.6
800	46.5	44.3	46.5	44.3	52.6	51.7	52.6	52.1
850	45.9	43.7	45.9	43.7	52.1	51.2	52.1	51.6
900	45.3	43.2	45.3	43.2	51.6	50.7	51.6	51.1
950	44.8	42.6	44.8	42.7	51.1	50.2	51.2	50.6
1000	44.3	42.1	44.3	42.2	50.7	49.8	50.7	50.2

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Dist (ft)	East (dBA)	North (dBA)	West (dBA)	South (dBA)	East (dBC)	North (dBC)	West (dBC)	South (dBC)
5	87.4	94.8	87.8	99.3	94.3	100.6	94.6	103.3
25	61.7	62.0	61.8	63.5	71.0	71.0	71.0	71.6
50	56.8	57.2	56.9	57.6	65.8	65.7	65.7	65.9
75	54.7	54.3	54.6	54.2	62.9	62.6	62.8	62.6
100	53.3	52.1	53.4	51.9	60.8	60.2	60.7	60.3
150	50.4	48.9	50.3	48.6	57.5	56.9	57.5	57.1
200	48.1	46.6	48.0	46.0	55.2	54.5	55.1	54.6
250	46.2	44.7	46.1	44.1	53.3	52.6	53.2	52.7
300	44.7	43.3	44.7	42.6	51.9	51.3	51.9	51.4
350	43.5	42.1	43.5	41.3	50.8	50.2	50.8	50.2
400	42.5	41.0	42.4	40.2	49.8	49.2	49.7	49.2
450	41.5	40.0	41.5	39.2	48.9	48.3	48.8	48.3
500	40.7	39.2	40.6	38.3	48.1	47.5	48.0	47.5
550	39.9	38.4	39.8	37.5	47.4	46.7	47.3	46.8
600	39.2	37.6	39.1	36.7	46.7	46.1	46.6	46.1
650	38.5	37.0	38.5	36.0	46.1	45.4	46.0	45.4
700	37.9	36.4	37.9	35.4	45.5	44.8	45.4	44.9
750	37.4	35.8	37.3	34.8	44.9	44.3	44.9	44.3
800	36.8	35.2	36.8	34.3	44.4	43.8	44.3	43.8
850	36.4	34.7	36.3	33.8	44.0	43.3	43.9	43.3
900	35.9	34.3	35.8	33.3	43.5	42.8	43.4	42.9
950	35.4	33.8	35.4	32.8	43.0	42.4	43.0	42.4
1000	35.0	33.3	35.0	32.3	42.6	41.9	42.5	42.0

Dist (ft)	East (dBA)	North (dBA)	West (dBA)	South (dBA)	East (dBC)	North (dBC)	West (dBC)	South (dBC)
5	87.9	98.2	87.9	97.6	94.9	103.0	95.0	103.2
25	62.4	62.8	62.5	63.5	71.6	71.7	71.6	71.9
50	57.3	57.5	57.3	57.7	66.3	66.2	66.3	66.4
75	55.2	54.3	54.9	54.4	63.5	62.9	63.4	63.1
100	53.3	52.0	53.1	52.1	61.3	60.5	61.2	60.8
150	50.2	48.7	50.1	48.9	58.0	57.1	58.0	57.6
200	47.8	46.3	47.7	46.3	55.7	54.7	55.6	55.1
250	45.9	44.4	45.8	44.4	53.8	52.8	53.7	53.2
300	44.4	42.9	44.4	42.9	52.4	51.5	52.4	51.9
350	43.2	41.7	43.1	41.6	51.3	50.4	51.2	50.7
400	42.1	40.5	42.0	40.4	50.3	49.3	50.2	49.7
450	41.1	39.5	41.0	39.4	49.4	48.4	49.3	48.8
500	40.2	38.6	40.2	38.5	48.6	47.6	48.5	48.0
550	39.4	37.8	39.4	37.7	47.8	46.8	47.7	47.2
600	38.7	37.0	38.6	37.0	47.1	46.1	47.1	46.6
650	38.1	36.3	38.0	36.3	46.5	45.5	46.4	45.9
700	37.4	35.7	37.4	35.7	45.9	44.9	45.8	45.4
750	36.9	35.1	36.8	35.1	45.4	44.3	45.3	44.8
800	36.3	34.6	36.3	34.5	44.9	43.8	44.8	44.3
850	35.9	34.1	35.8	34.0	44.4	43.3	44.3	43.8
900	35.4	33.6	35.3	33.6	43.9	42.9	43.9	43.4
950	34.9	33.1	34.8	33.1	43.5	42.4	43.4	42.9
1000	34.5	32.6	34.4	32.6	43.1	42.0	43.0	42.5