

## NOISE IMPACT STUDY - Project: 16017

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### **Burl's Creek Event Grounds** Oro-Medonte, ON

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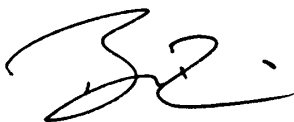
Prepared for:

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Prepared by:



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12 February 2016

## Table of Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
<b>2</b>	<b>Site Description and Background</b>	<b>3</b>
2.1	Review of Jade Acoustics Report.....	4
<b>3</b>	<b>Acoustic Model</b>	<b>5</b>
3.1	Sound Sources .....	5
3.1.1	Stage Sound Levels .....	5
3.1.2	Stage Sound Spectrum Shape .....	5
3.1.3	Stage Sound Directivity .....	6
<b>4</b>	<b>Results and Recommendations</b>	<b>7</b>
4.1	Stage Mitigation Measures.....	7
4.1.1	Reducing Source Levels .....	7
4.1.2	Changing Stage orientation .....	8
<b>5</b>	<b>Parking and Camping</b>	<b>8</b>
<b>6</b>	<b>Conclusions</b>	<b>9</b>

## **1 Introduction**

Aercoustics was retained by Burl's Creek Event Grounds Inc. (Burl's Creek) to conduct a noise impact study of the Burl's Creek Event Grounds; specifically the WayHome and Boots and Hearts music festival special events. These two music events are hosted each summer with multiple sound stages, parking and camping.

It is understood that the noise impact study is a requirement of the Township of Oro-Medonte and County of Simcoe. Its purpose was to investigate the noise of these events onto the surrounding environment and to develop practical measures that can be implemented to reduce the off property noise levels.

This report was based on information provided by Burl's Creek and noise measurements conducted by Jade Acoustics (Jade) and presented in their report<sup>1</sup>. Jade was retained by the Township of Oro-Medonte to conduct noise measurements during the 2015 WayHome and Boots and Hearts music events.

## **2 Site Description and Background**

Burl's Creek Event Grounds is Canada's largest outdoor event venue. It is located at 180 8<sup>th</sup> Line South in Oro-Medonte, Ontario.

Figure 1 presents a Google Maps aerial image of the area illustrating the location of the Burl's Creek Event Grounds as well as identified residences in the vicinity. Note that the residences were identified by a Google Maps search.

The lands have the ability to play host to a number of events, including music events such as WayHome Music and Arts Festival and the Boots and Hearts Festival. Figures 2 and 3 present respectively the site plans for the WayHome and Boots and Hearts events.

The Township and County have requested that a noise impact study be submitted in support of the proposed Planning Act applications for the subject lands. In 2015, Jade conducted noise measurements for the Township to quantify the Burl's Creek generated noise levels both on and off property.

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<sup>1</sup> Jade Acoustics report entitled "Environmental Noise Measurements, Burl's Creek Music Festivals" dated December 16, 2015

## **2.1 Review of Jade Acoustics Report**

Jade Acoustics conducted noise measurements in 2015 during the time periods when the WayHome (July 24-26, 2015) and Boots and Hearts (August 6-9, 2015) music festivals were held. The measurements consisted of both unattended and attended noise measurements.

Based on their unattended measurements they concluded that "...exceedances cannot be definitively attributed to concert activities...". It was explained that the measured noise levels were affected by atmospheric conditions and noises caused by other activities not related to Burl's Creek.

In the summary section of the report Jade concluded that "The sound level limits as outlined in the agreement between Oro-Medonte and Burl's Creek were exceeded the majority of the time." It appears, however, this conclusion only relates to the Boots and Hearts dance party.

The Jade measured the sound levels during the WayHome event at the front of house (sound board) of the main stage at up to 108 dBA and a typical level of 103 dBA. During the Boots and Hearts event they measured main stage front of house levels of a maximum of 104 dBA and typical level of 99 dBA. Although not provided in the report, it is understood that the front of house position is at 125 ft (38m) from the stage.

Jade recommended that "...sound level compliance be assessed by setting a maximum sound level to be achieved at the sound boards of the concerts as well as the dance parties." They concluded that this would allow for compliance to be easily assessed.

### 3 Acoustic Model

Aercoustics constructed an acoustical model of the Burl's Creek music festivals. This model was used to investigate environmental noise mitigation measures and their effectiveness at off property locations. Investigated mitigation measures included sound system volume, sound system/stage orientation and directivity.

#### 3.1 Sound Sources

The dominant noise source of the Burl's Creek facility is sound system enhanced music played on the stages.

##### 3.1.1 Stage Sound Levels

Based on information provided by Burl's Creek, Table 1 presents the front of house (sound board) sound levels for each of the music stages.

Table 1 Stage Front of House music levels

Festival	Stage # and Name	Stage to Front of House distance	Max. Sound Level (dBA)	Operation Times
WayHome	1. WayHome	125 ft (38 m)	105	1pm – 11 pm
	2. WayBold	75 ft (23 m)	100	1pm – 2am
	3. WayAway	75 ft (23 m)	98	1pm – 2am
	4. WayBright	100 ft (30 m)	100	1pm – 2am
Boots and Hearts	1. Main Stage	125 ft (38 m)	105	1pm – 11 pm
	2. Front Porch	75 ft (23 m)	100	1pm – 1am
	3. Fan Fair Village Stage	50 ft (15 m)	90	1pm – 6pm

##### 3.1.2 Stage Sound Spectrum Shape

Aercoustics used the following 1/1 octave spectrum shape to represent the music spectrum at the front of house location. The following table presents the music spectrum used for the main stage front of house levels (i.e. 105 dBA overall sound level)

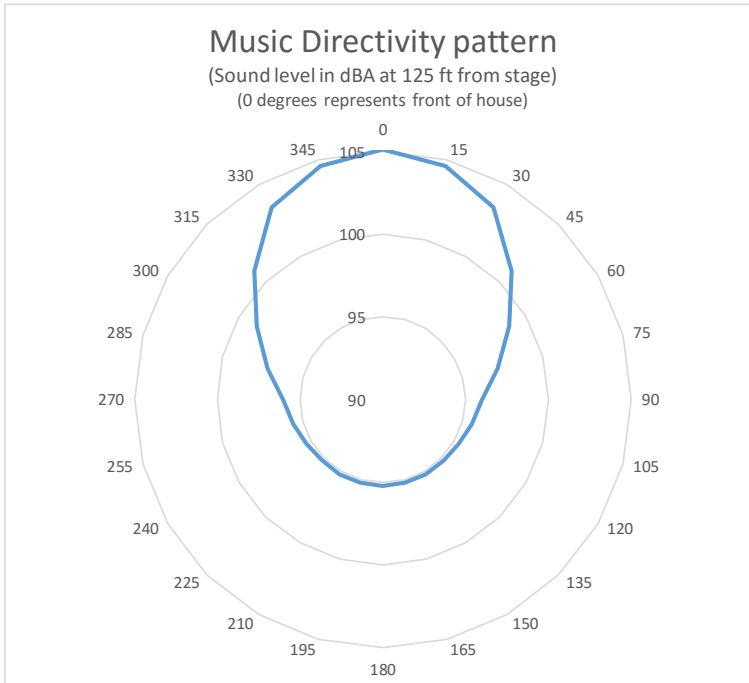
Table 2 Music Front of House Spectrum shape

Sound Levels (dB) in Octave Bands (Hz)								
Octave band centre frequencies (Hz)								
31.5	63	125	250	500	1000	2000	4000	8000
92	107	107	107	102	97	97	92	88

The same spectrum shape was used for all stages, adjusting the sound levels to represent the front of house sound levels listed in Table 1.

### 3.1.3 Stage Sound Directivity

A horizontal directivity pattern typical for an outdoor concert sound system was applied. Graph 1 presents the overall A-weighted sound level versus angle from the stage for the reference main stage front of house levels (i.e. 105 dBA at front of house).



Graph 1 Stage Sound Directivity

The same directivity pattern was used for all stages save for WayHome stage 3 (WayAway) and Boots and Hearts Fan Fair Village Stage. The WayAway Stage has a pseudo-surround setup with 50% of the music energy is from the stage and 25% for each of the two surround channels. For the Boots and Hearts Fan Fair Stage an omnidirectional sound pattern was used.

## 4 Results and Recommendations

Sound level predictions were performed for both music festivals modelling the Stages as sound sources, with parameters as described in the previous section. The stage orientations were obtained from Burl's Creek and were consistent with the information in the Jade report.

Figures 4a and 4b present the sound level contours predicted for the WayHome music festival predicting the levels with simultaneous operation of all active stages for the time periods of 1pm – 11pm and 11pm to 2am respectively. The difference in the stage operation for the different time periods is that the WayHome stage (main stage) only operates from 1pm – 11 pm.

Figures 5a, 5b and 5c present the sound level contours predicted for the Boots and Hearts music festival predicting the levels for the time periods of 1pm – 6pm with all stages operating, 1pm – 11pm with the Main and Front Porch stages operating and 11pm to 1am with only the Front Porch Stage on. The dance party takes place at 11pm to 1am at the Front Porch Stage.

### 4.1 Stage Mitigation Measures

#### 4.1.1 Reducing Source Levels

The most obvious measure to reduce the noise levels in the community is to reduce the source sound levels. As the main stage (Stage 1) is by far the most significant sound source for both the WayHome and Boots and Hearts music events, reducing its sound level will have the greatest effect on reducing the off property noise levels.

Aercoustics recommends a reduction in Stage source sound levels. Based on communication with Burl's Creek, the reduced source levels listed in Table 2 can be accommodated.

Table 2 Reduced Stage Front of House music levels

Festival	Stage # and Name	Stage to Front of House distance	Max. Sound Level (dBA)	Operation Times
WayHome	1. WayHome	125 ft (38 m)	100	1pm – 11 pm
	2. WayBold	75 ft (23 m)	98	1pm – 2am
	3. WayAway	75 ft (23 m)	98	1pm – 2am
	4. WayBright	100 ft (30 m)	98	1pm – 2am
Boots and Hearts	1. Main Stage	125 ft (38 m)	100	1pm – 11 pm
	2. Front Porch	75 ft (23 m)	95	1pm – 1am
	3. Fan Fair Village Stage	50 ft (15 m)	85	1pm – 6pm

Figures 6a and 6b present the sound level contours predicted with the reduced stage sound levels listed above for the WayHome music festival predicting the levels with all stages operating simultaneously for the time periods of 1pm – 11pm and 11pm to 2am respectively.

This mitigation measure was found to reduce the off property sound levels by approximately 5 dB. This should be perceived as a noticeable improvement.

Figures 7a through 7c present the sound level contours predicted with the reduced stage sound levels listed above for the Boots and Hearts music festival. As with the WayHome festival, this mitigation measure was found to reduce the off property sound levels by approximately 5 dB.

It is therefore recommended to implement the reduced stage sound levels for the 2016 music festival events, conduct noise measurements on and off property and evaluate its effectiveness.

#### 4.1.2 Changing Stage orientation

Several model iterations of the acoustic model changing the directions of the stages with the objective of reducing the sound levels at the dwellings. Re-orienting the stages did not result in any significant reductions. The exercise, however, determined that the current stage orientation is close to optimized for off property noise levels. A change in stage orientation is therefore not recommended.

## 5 Parking and Camping

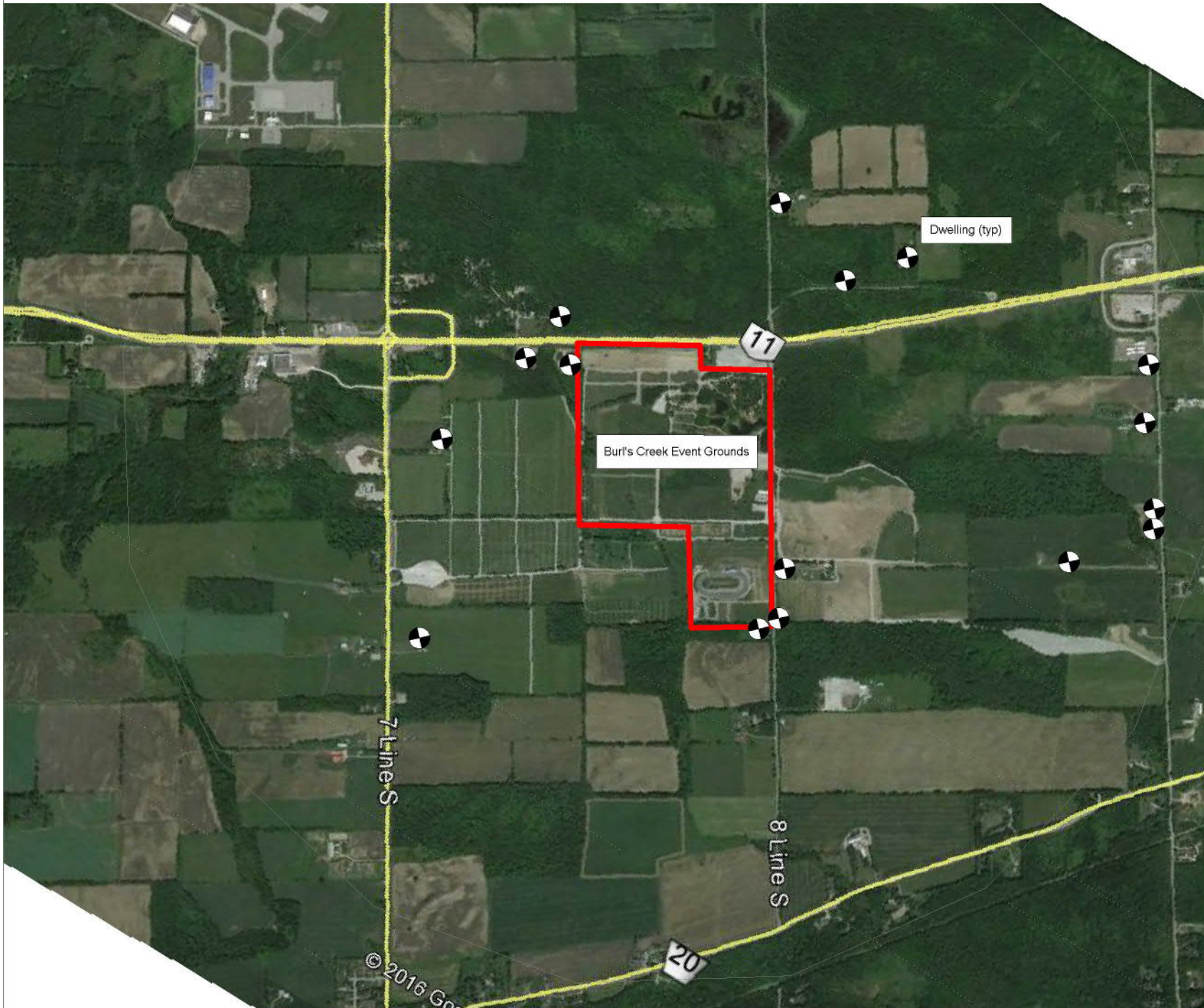
The music festivals use the grounds adjacent to the music festival event grounds for both parking and camping for the patrons attending the music festivals. Activity in these parking/camping areas can create noise that could generate environmental noise impact. It is the author's opinion that meaningful noise predictions of noise generated in the parking/camping areas is not possible. However, administrative controls could be considered to limit the likelihood of noisy activities. The following should be considered:

1. Add signage to indicate that the parking/camping area is a quiet area.
2. Require that no amplified music (car stereos, or similar) be allowed after 2am.



## 6 Conclusions

Aercoustics was retained by Burl's Creek Event Grounds Inc. (Burl's Creek) to conduct a noise impact study of the Burl's Creek Event Grounds; specifically, the WayHome and Boots and Hearts music festival special events. To mitigate the off property noise both the reduction of stage sound levels and stage directions were studied. It was concluded that reducing the stage source levels is the only practical way to reduce off property sound levels. It is recommended to implement the reduced stage sound levels for the 2016 music festival events, conduct noise measurements on and off property and evaluate its effectiveness.



Dwelling (typ)

Burl's Creek Event Grounds

7 Line S

8 Line S

77

20

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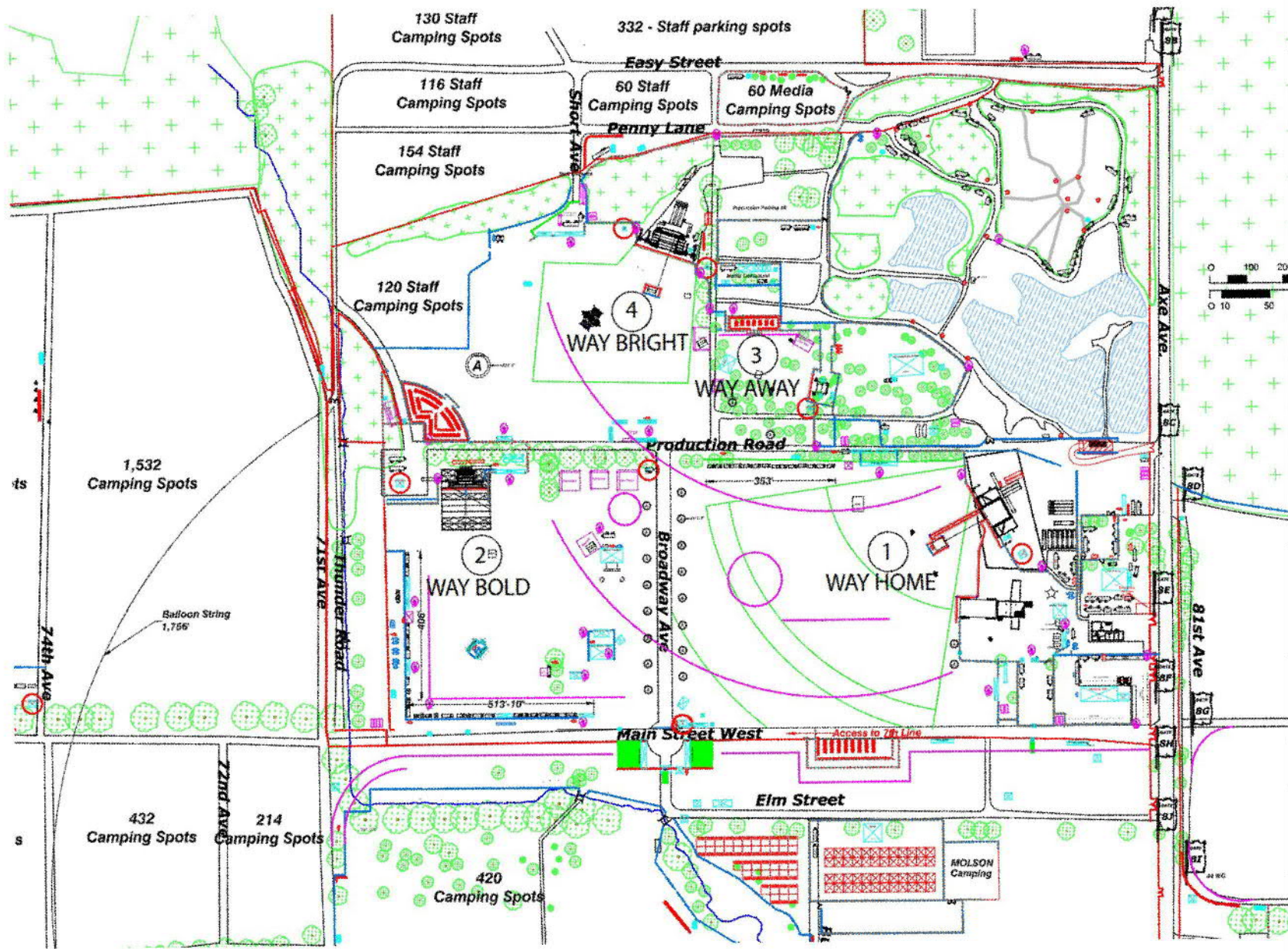


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**Project Name**  
 Burl's Creek  
 Event Grounds

**Figure Title**  
 Location Plan  
 illustrating dwellings  
 in the vicinity

**Figure 1**



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Revision: 1

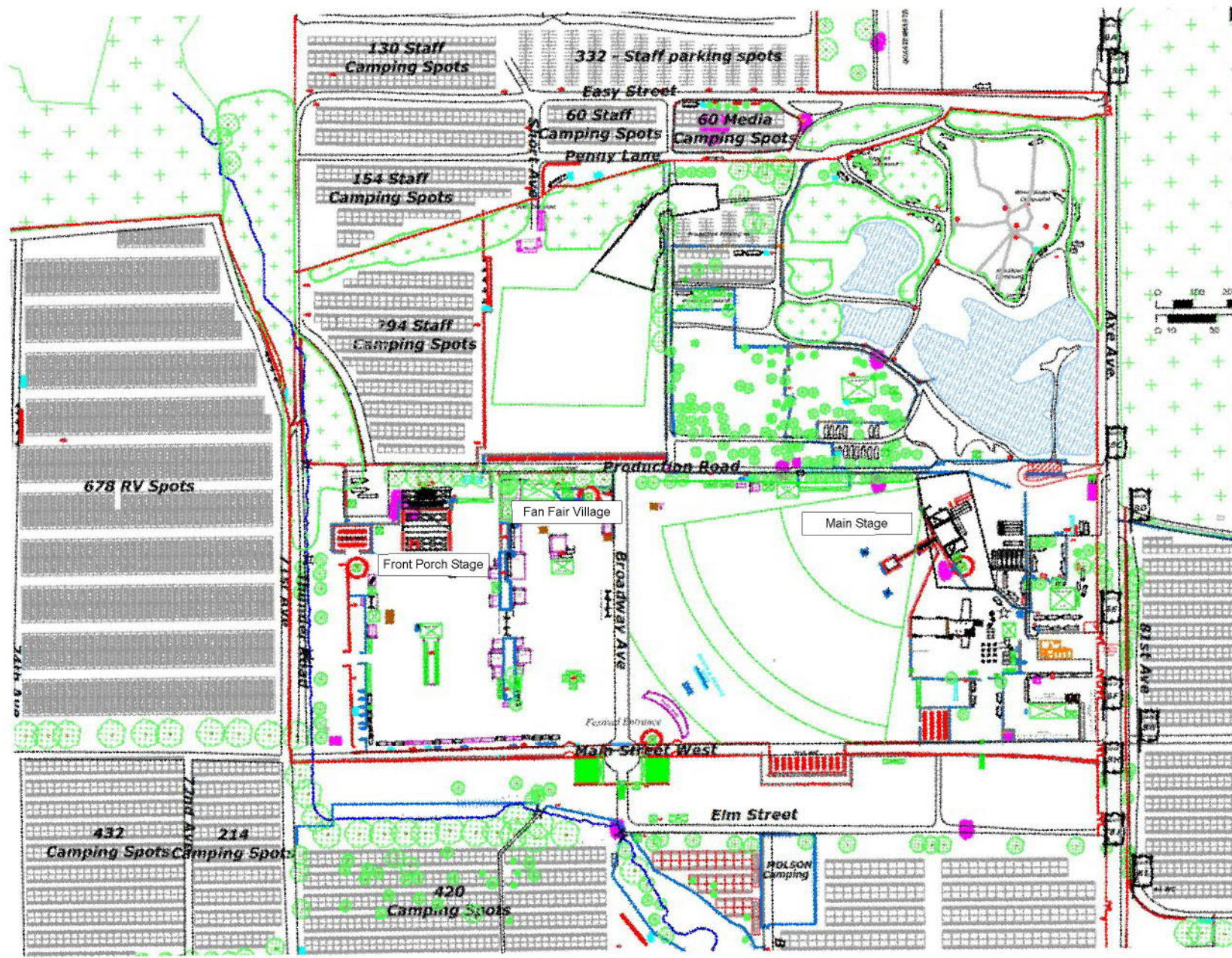


Project ID: 16017.00

Project Name  
Burl's Creek  
Event Grounds

Figure Title  
Site Plan illustrating  
WayHome  
Stage positions

**Figure 2**



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Reviewed by: BR  
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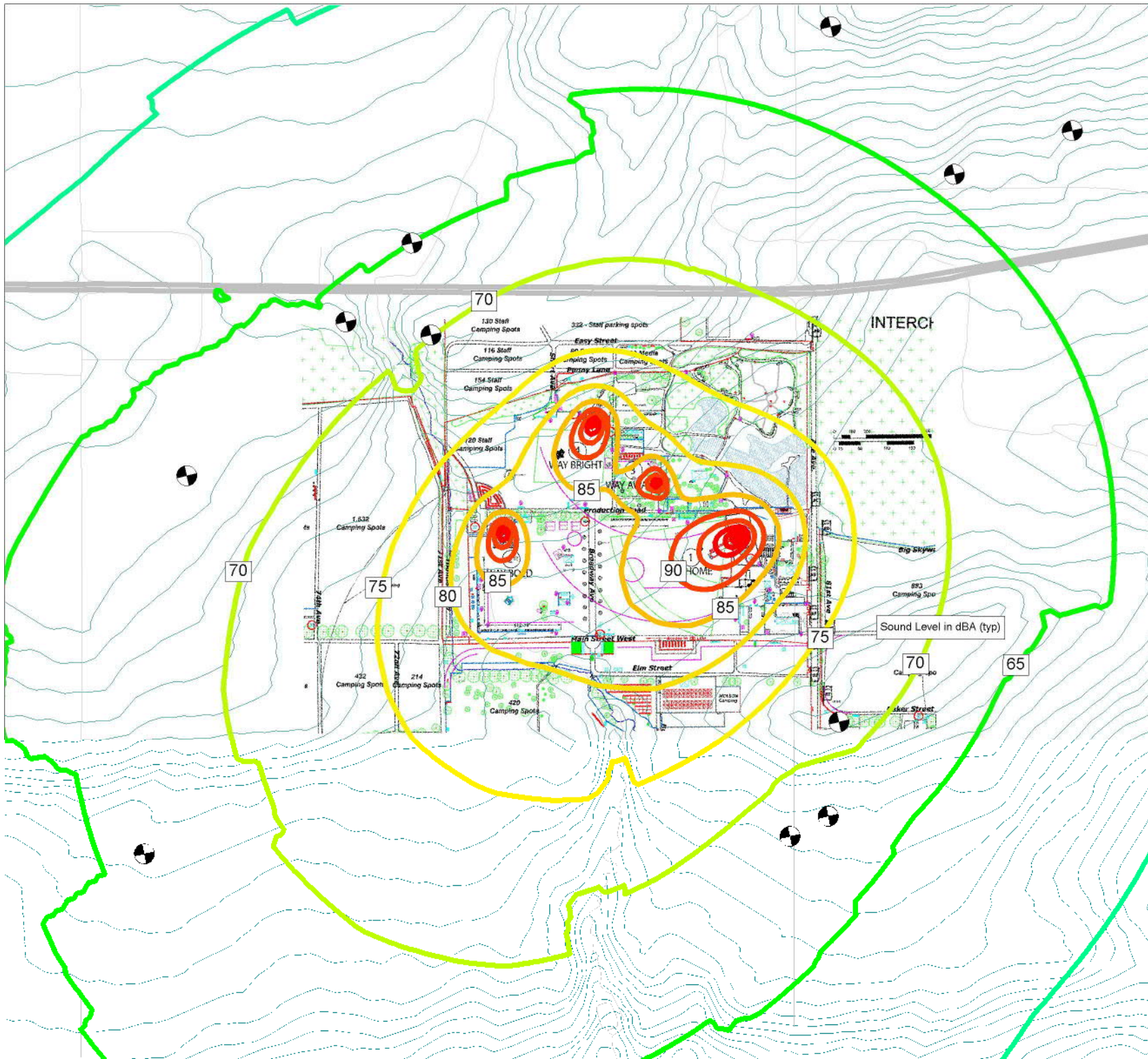


Project ID: 16017.00

Project Name  
Burl's Creek  
Event Grounds

Figure Title  
Site Plan illustrating  
Boots and Hearts  
Stage positions

**Figure 3**



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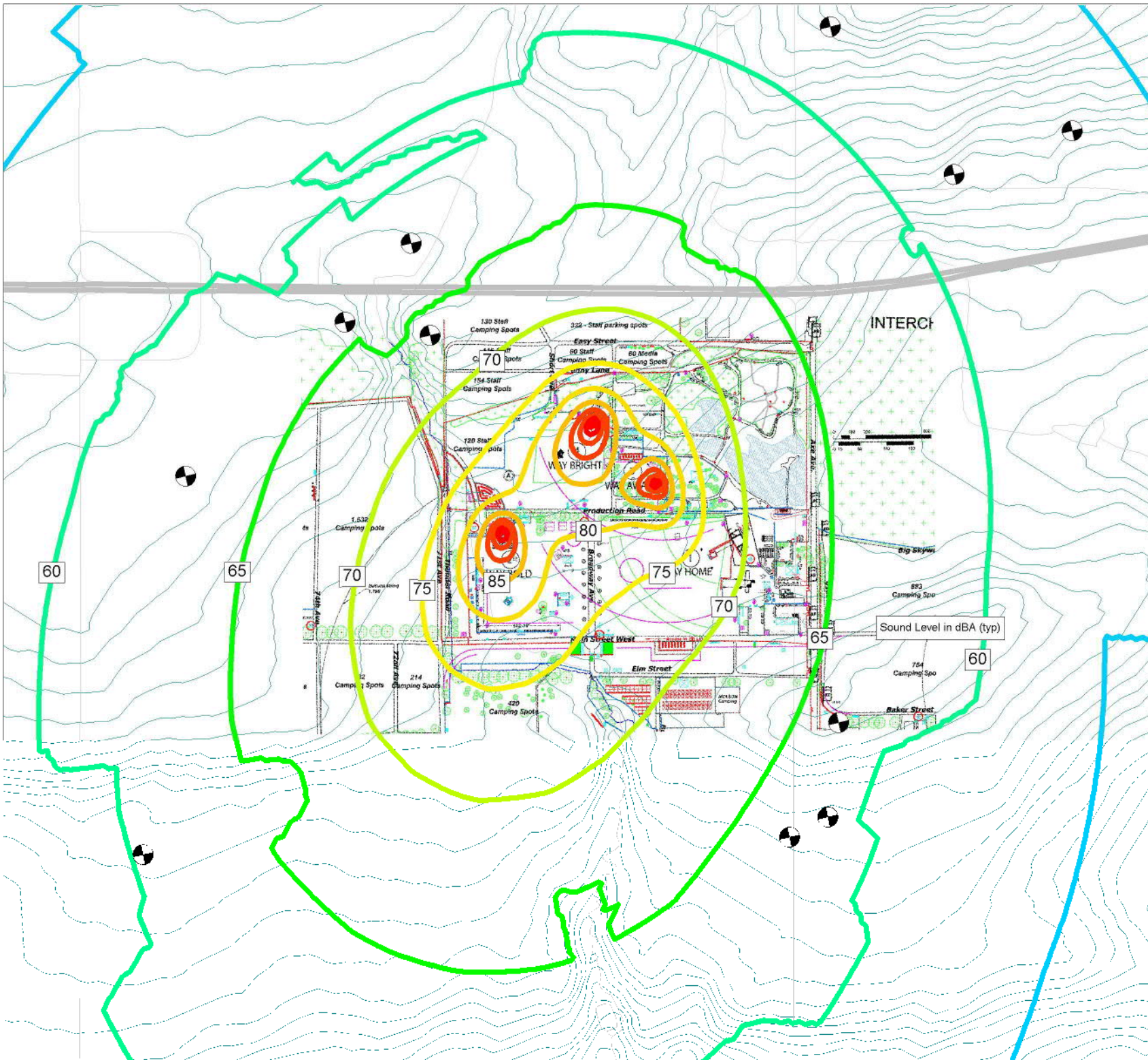


Project ID: 16017.00

**Project Name**  
 Burl's Creek  
 Event Grounds

**Figure Title**  
 Predicted Noise Contours  
 WayHome Festival  
 (1pm-11pm)

**Figure 4a**

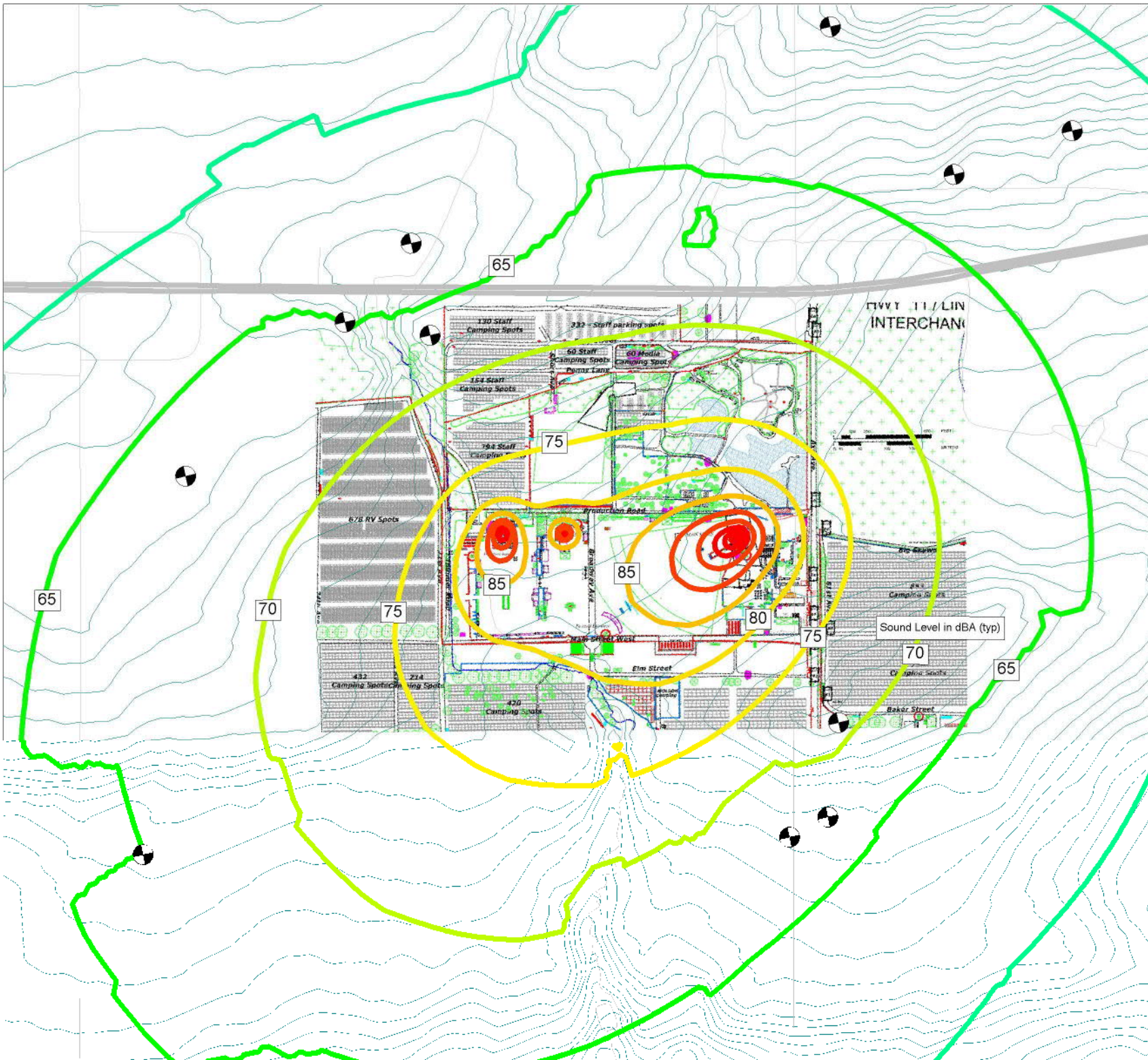


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 Revision: 1



Project ID: 16017.00  
**Project Name**  
 Burl's Creek  
 Event Grounds  
**Figure Title**  
 Predicted Noise Contours  
 WayHome Festival  
 (11pm-2am)

**Figure 4b**

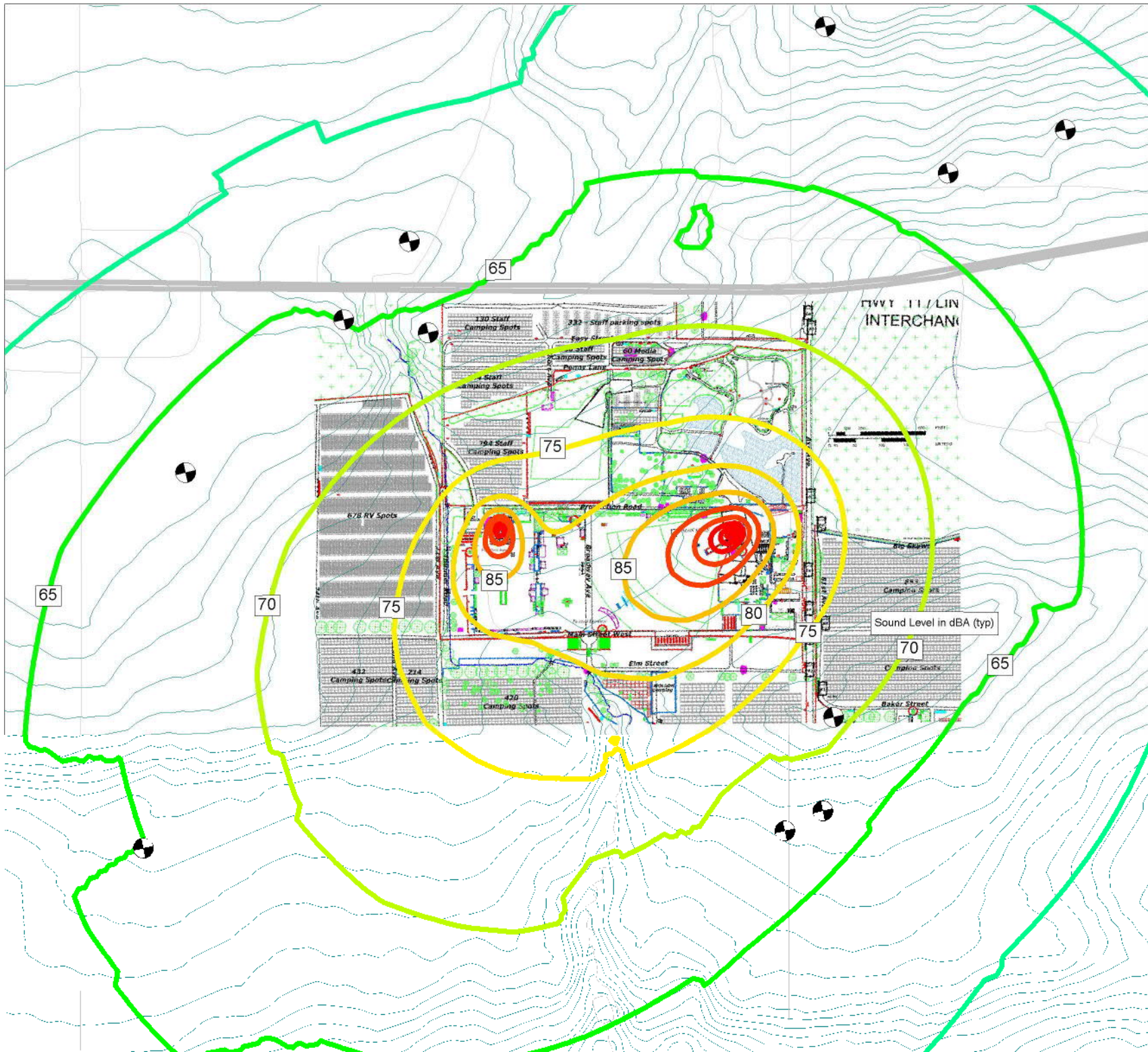


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Project ID: 16017.00  
**Project Name**  
 Burl's Creek  
 Event Grounds  
**Figure Title**  
 Predicted Noise Contours  
 Boots and Hearts Festival  
 (1pm-6pm)

**Figure 5a**



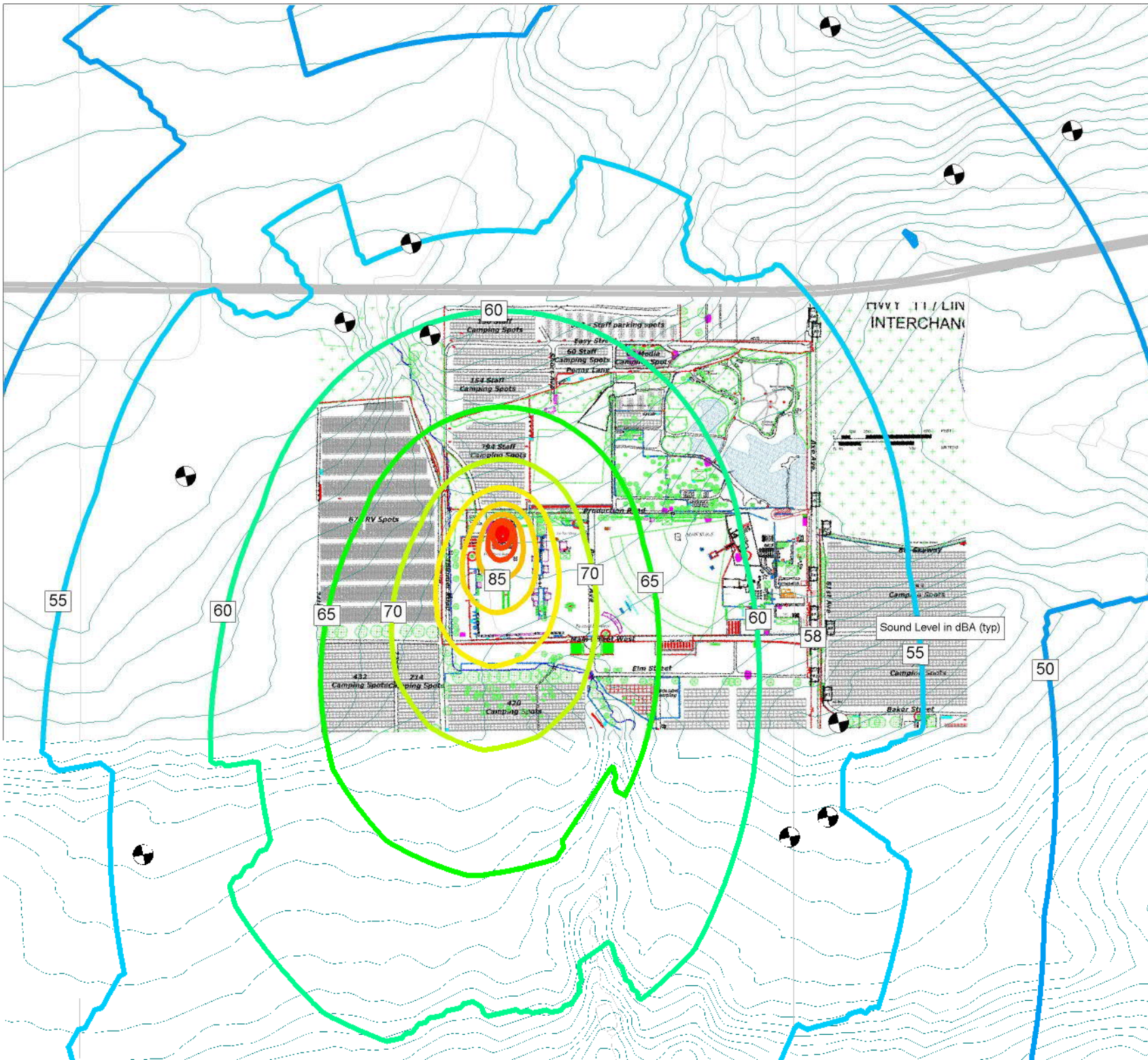
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Project ID: 16017.00  
**Project Name**  
 Burl's Creek  
 Event Grounds  
**Figure Title**  
 Predicted Noise Contours  
 Boots and Hearts Festival  
 (6pm-11pm)

**Figure 5b**



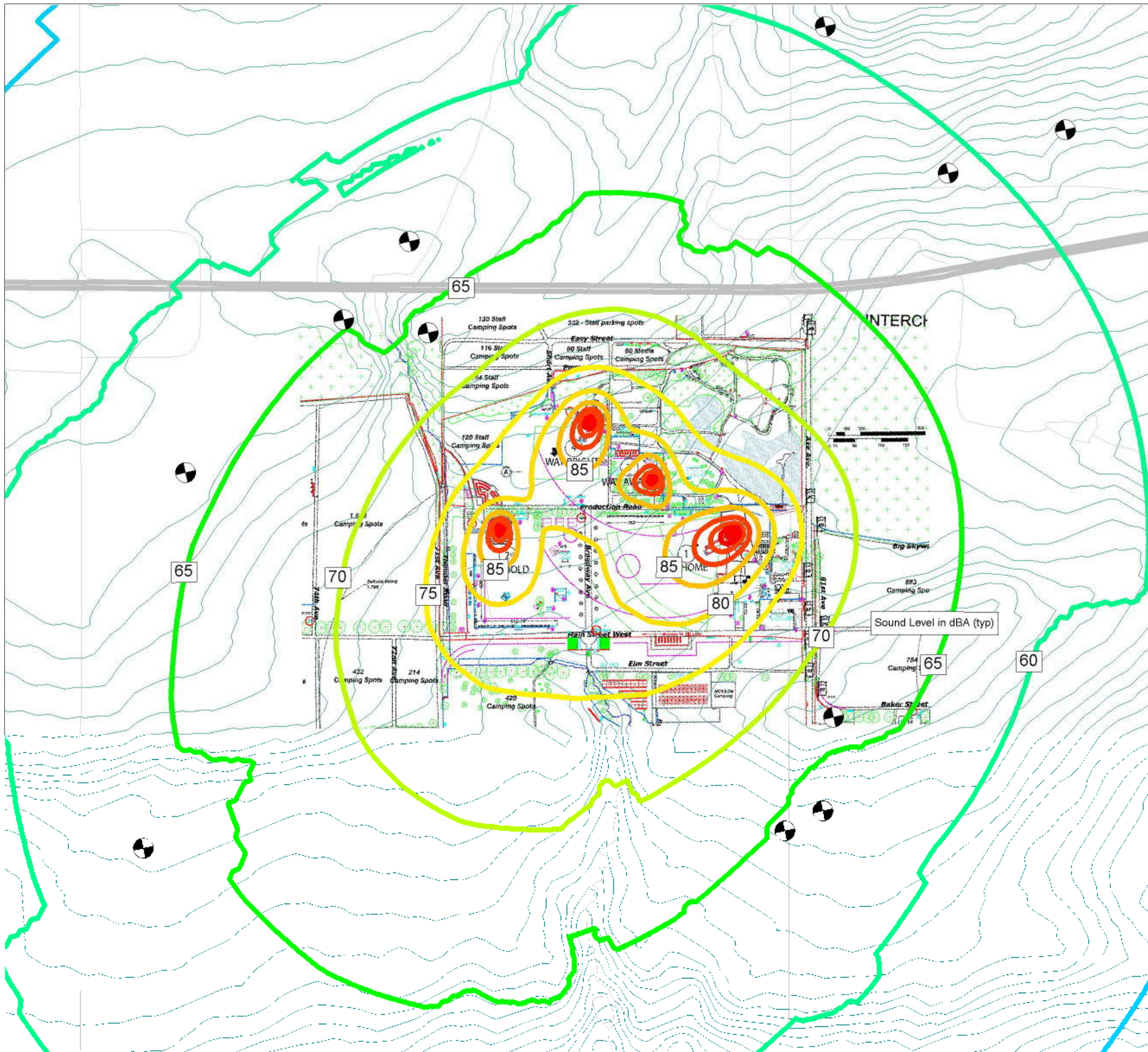


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**Project Name**  
 Burl's Creek  
 Event Grounds  
**Figure Title**  
 Predicted Noise Contours  
 Boots and Hearts Festival  
 (11pm-1am)

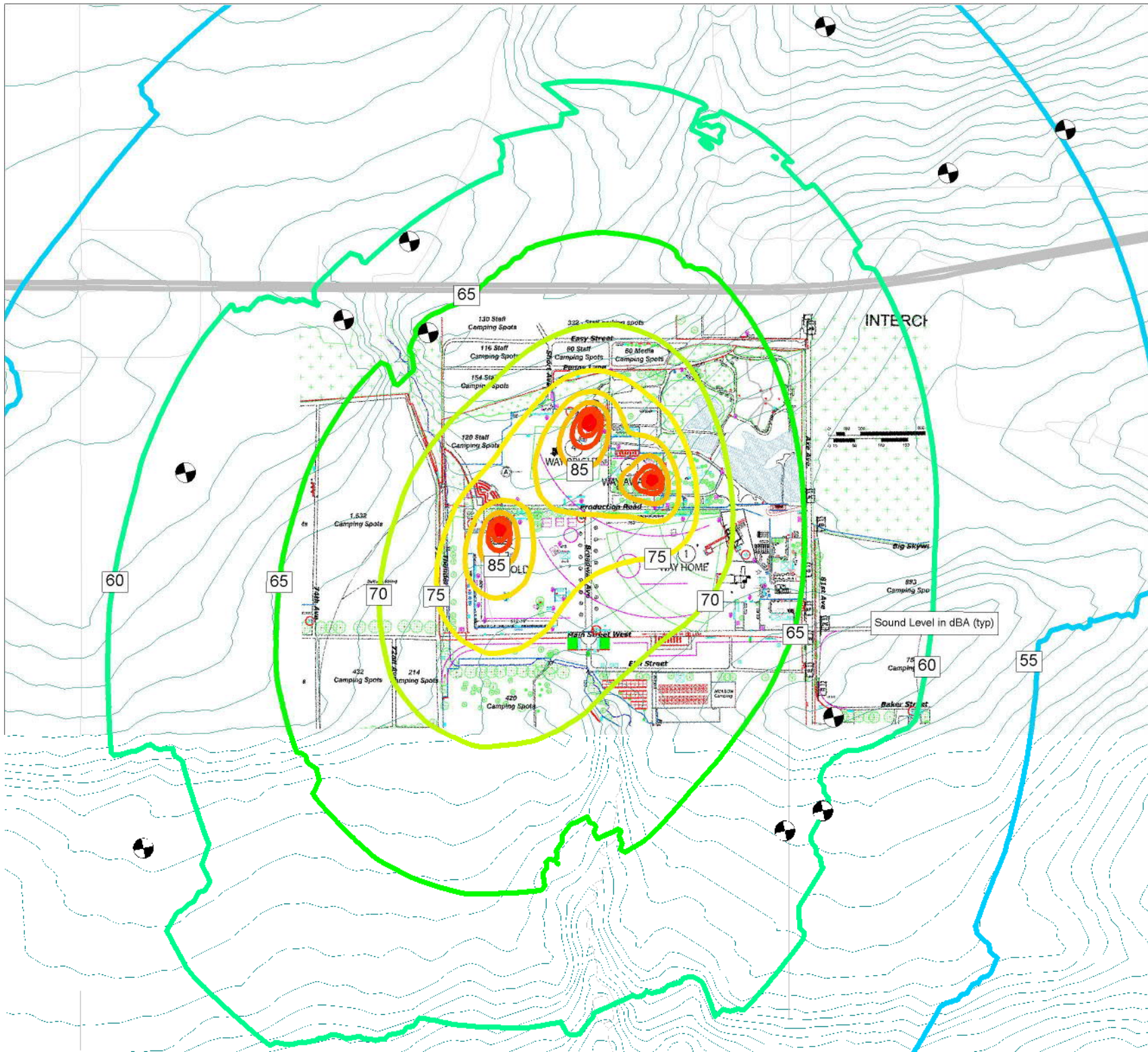
**Figure 5c**



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Project ID: 16017.00  
**Project Name**  
 Burl's Creek  
 Event Grounds  
**Figure Title**  
 Predicted Noise Contours  
 WayHome Festival  
 (1pm-11pm)  
 with reduced stage  
 sound levels

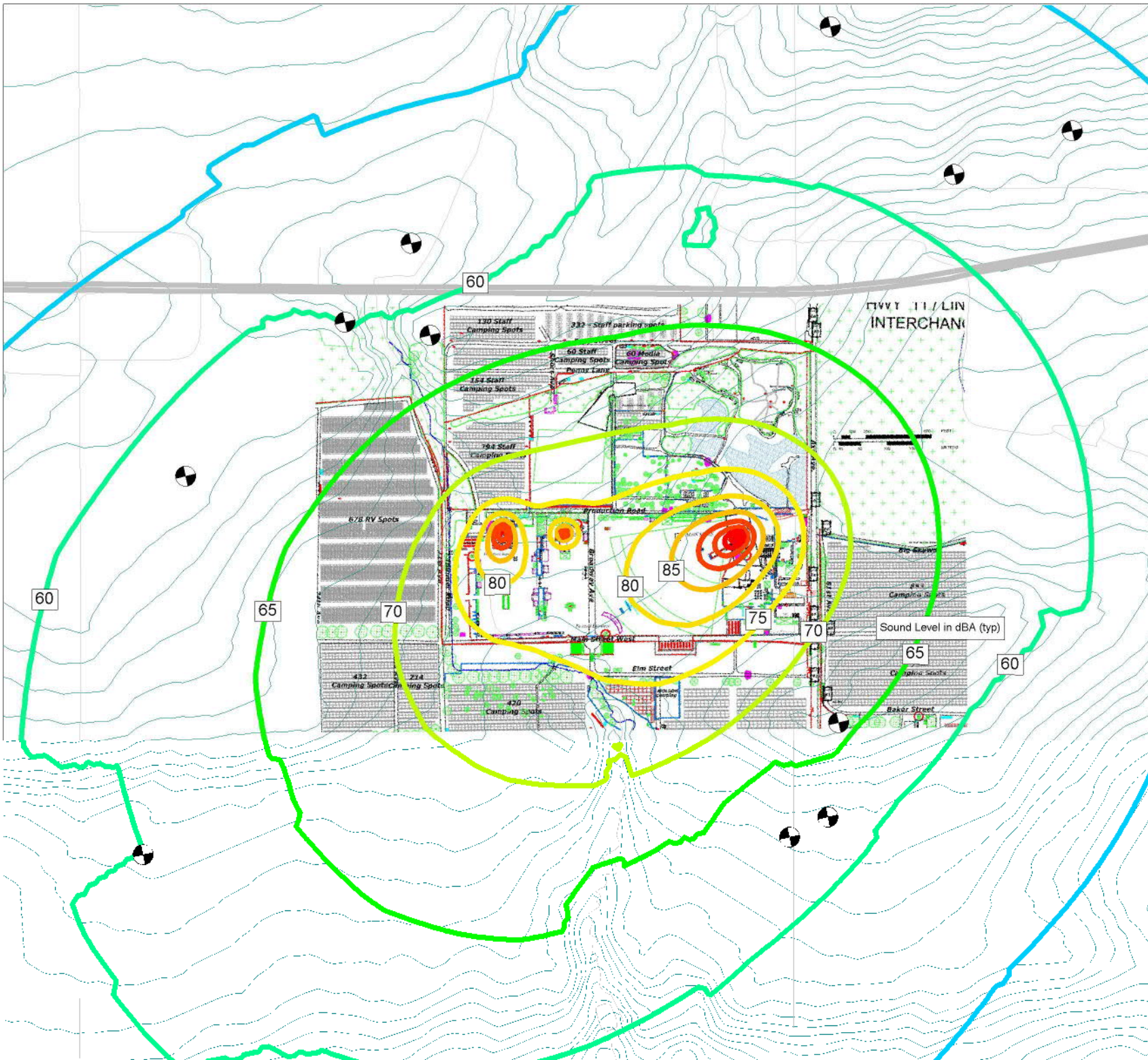
**Figure 6a**



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Project ID: 16017.00  
**Project Name**  
 Burl's Creek  
 Event Grounds  
**Figure Title**  
 Predicted Noise Contours  
 WayHome Festival  
 (11pm-2am)  
 with reduced stage  
 sound levels

**Figure 6b**



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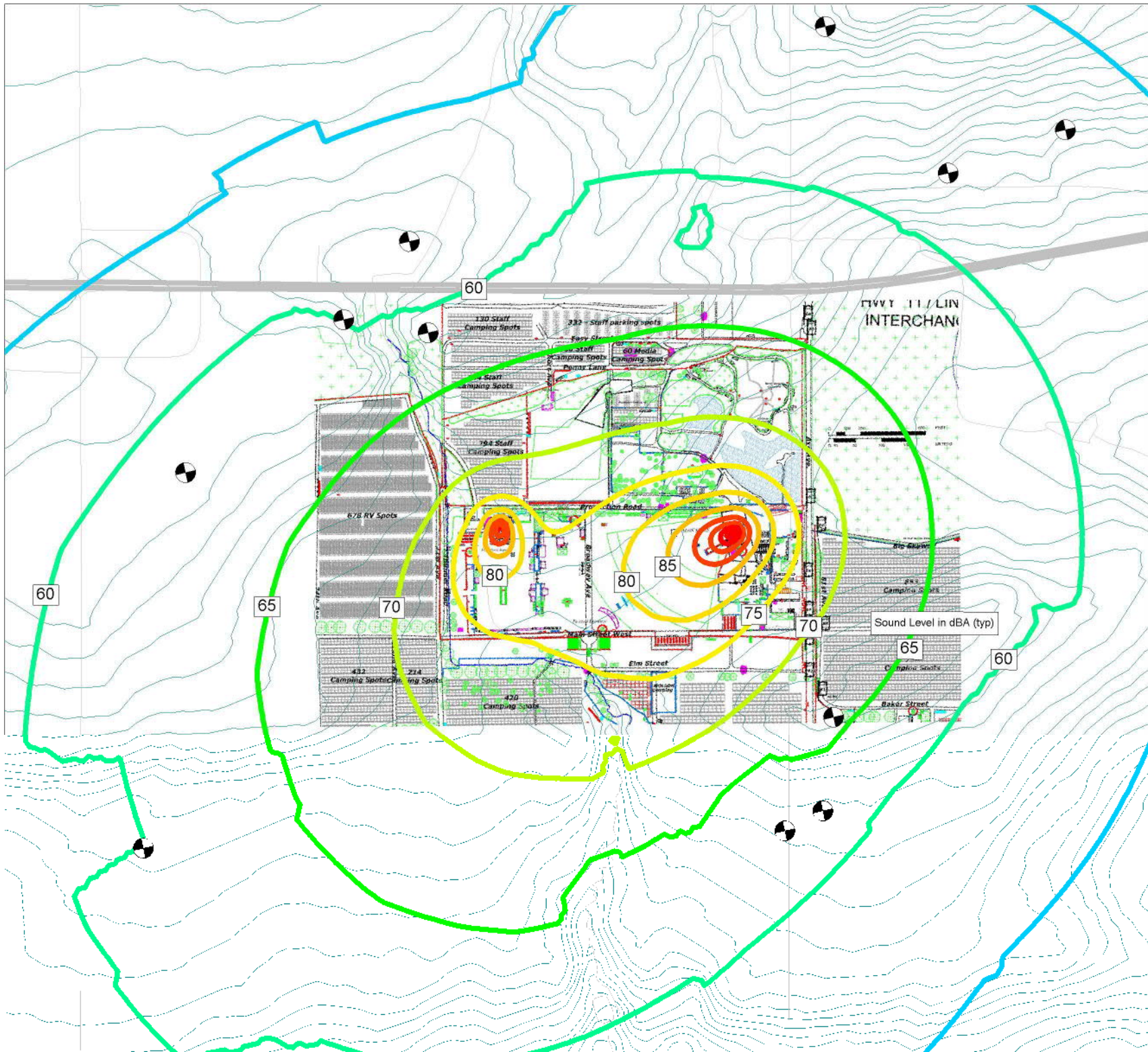


Project ID: 16017.00

**Project Name**  
 Burl's Creek  
 Event Grounds

**Figure Title**  
 Predicted Noise Contours  
 Boots and Hearts Festival  
 (1pm-6pm)  
 with reduced stage  
 sound levels

**Figure 7a**

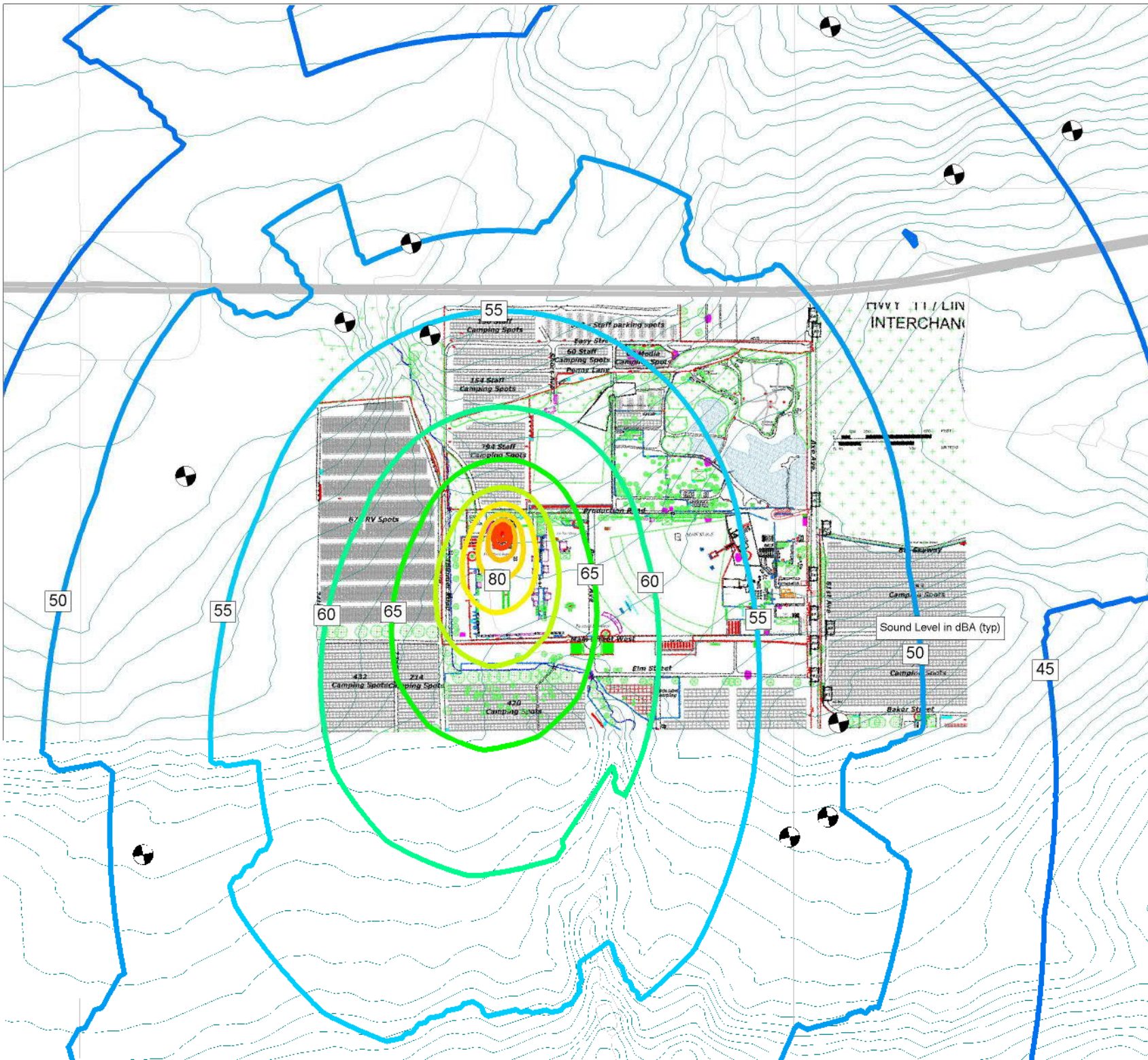


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Project ID: 16017.00  
**Project Name**  
 Burl's Creek  
 Event Grounds  
**Figure Title**  
 Predicted Noise Contours  
 Boots and Hearts Festival  
 (6pm-11pm)  
 with reduced stage  
 sound levels

**Figure 7b**



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Project ID: 16017.00

**Project Name**  
 Burl's Creek  
 Event Grounds

**Figure Title**  
 Predicted Noise Contours  
 Boots and Hearts Festival  
 (11pm-1am)  
 with reduced stage  
 sound levels

**Figure 7c**