

# **APPENDIX F**

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## Noise Modeling Results

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Clearing and Grubbing/Stripping**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Factor <sup>1</sup>
	100	74.6	<b>Dozer</b>	85	0.4
	200	66.7	<b>Front End Loader</b>	80	0.4
	300	62.0	<b>Water Truck</b>	75	0.4
	400	58.7			
	500	56.2			
	600	54.1			
	700	52.3			
	800	50.8	<b>Ground Type</b>	Soft	
	900	49.5	<b>Source Height</b>	5	
	1000	48.3	<b>Receiver Height</b>	8	
	1100	47.2	<b>Ground Factor</b>	0.63	
	1200	46.2			
			<b>Predicted Noise</b>		
			<b>Level <sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>	
			<b>Dozer</b>	81.0	
			<b>Front End Loader</b>	76.0	
			<b>Water Truck</b>	71.0	
			<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>		
			82.5		

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Dewatering**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Factor <sup>1</sup>
	100	80.9	Crane	85	0.16
	200	73.0	Generator	82	0.5
	300	68.3	Impact Pile Driver	95	0.2
	400	65.0			
	500	62.5			
	600	60.4			
	700	58.6			
	800	57.1	Ground Type	Soft	
	900	55.8	Source Height	5	
	1000	54.6	Receiver Height	8	
	1100	53.5	Ground Factor	0.63	
	1200	52.5			
			<b>Predicted Noise</b>		
			<b>Level <sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>	
			Crane	77.0	
			Generator	79.0	
			Impact Pile Driver	88.0	
			<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>		
			88.8		

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Excavation**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage Factor <sup>1</sup>
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	
	100	76.3	<b>Excavator</b>	85	0.4
	200	68.4	<b>Front End Loader</b>	80	0.4
	300	63.8	<b>Dump Truck</b>	84	0.4
	400	60.5			
	500	57.9			
	600	55.8			
	700	54.1			
	800	52.5	<b>Ground Type</b>	Soft	
	900	51.2	<b>Source Height</b>	5	
	1000	50.0	<b>Receiver Height</b>	8	
	1100	48.9	<b>Ground Factor</b>	0.63	
	1200	47.9			
			<b>Predicted Noise</b>		
			<b>Level<sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>	
			<b>Excavator</b>	81.0	
			<b>Front End Loader</b>	76.0	
			<b>Dump Truck</b>	80.0	
			<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>		
					84.3

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Foundation Construction**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Factor <sup>1</sup>
	100	80.9	<b>Generator</b>	82	0.5
	200	73.0	<b>Crane</b>	85	0.16
	300	68.3	<b>Impact Pile Driver</b>	95	0.2
	400	65.0			
	500	62.5			
	600	60.4			
	700	58.6			
	800	57.1	<b>Ground Type</b>	Soft	
	900	55.8	<b>Source Height</b>	5	
	1000	54.6	<b>Receiver Height</b>	8	
	1100	53.5	<b>Ground Factor</b>	0.63	
	1200	52.5			
			<b>Predicted Noise</b>		
			<b>Level <sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>	
			<b>Generator</b>	79.0	
			<b>Crane</b>	77.0	
			<b>Impact Pile Driver</b>	88.0	
			<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>		
					88.8

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
 SAFCA - Concrete Construction



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level ( $L_{eq}$ dBA)	Assumptions:	Reference Emission	Usage
				Noise Levels ( $L_{max}$ ) at 50 feet <sup>1</sup>	Factor <sup>1</sup>
	100	75.8	<b>Generator</b>	82	0.5
	200	67.9	<b>Concrete Pump Truck</b>	82	0.2
	300	63.3	<b>Concrete Mixer Truck</b>	85	0.4
	400	60.0			
	500	57.4			
	600	55.3			
	700	53.6			
	800	52.0	<b>Ground Type</b>	Soft	
	900	50.7	<b>Source Height</b>	5	
	1000	49.5	<b>Receiver Height</b>	8	
	1100	48.4	<b>Ground Factor</b>	0.63	
	1200	47.4			
<b>Predicted Noise</b>					
			<b>Level</b> <sup>2</sup>	<b><math>L_{eq}</math> dBA at 50 feet<sup>2</sup></b>	
			<b>Generator</b>	79.0	
			<b>Concrete Pump Truck</b>	75.0	
			<b>Concrete Mixer Truck</b>	81.0	
<b>Combined Predicted Noise Level (<math>L_{eq}</math> dBA at 50 feet)</b>					
				83.8	

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Pipeline Construction**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Factor <sup>1</sup>
	100	75.0	Excavator	85	0.4
	200	67.1	Crane	85	0.16
	300	62.5	Compactor (ground)	80	0.2
	400	59.2			
	500	56.6			
	600	54.5			
	700	52.8			
	800	51.2	Ground Type	Soft	
	900	49.9	Source Height	5	
	1000	48.7	Receiver Height	8	
	1100	47.6	Ground Factor	0.63	
	1200	46.6			
<b>Predicted Noise</b>					
			<b>Level <sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>	
			Excavator	81.0	
			Crane	77.0	
			Compactor (ground)	73.0	
<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>					
				82.9	

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Backfill and Finish Grading**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Factor <sup>1</sup>
	100	76.7	Front End Loader	80	0.4
	200	68.8	Dozer	85	0.4
	300	64.2	Grader	85	0.4
	400	60.9			
	500	58.3			
	600	56.2			
	700	54.5			
	800	53.0	Ground Type	Soft	
	900	51.6	Source Height	5	
	1000	50.4	Receiver Height	8	
	1100	49.3	Ground Factor	0.63	
	1200	48.3			
<b>Predicted Noise</b>					
			<b>Level<sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>	
			Front End Loader	76.0	
			Dozer	81.0	
			Grader	81.0	
<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>					
				84.7	

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.



**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Electrical and Mechanical Equipment Installation**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>		Usage Factor <sup>1</sup>
Threshold*	100	73.2	<b>Crane</b>	85	0.16	
	200	65.3		<b>Pickup Truck</b>		55
	300	60.6		<b>Generator</b>		82
	400	57.4				
	500	54.8				
	600	52.7				
	700	51.0				
	800	49.4	<b>Ground Type</b>	Soft		
	900	48.1	<b>Source Height</b>	5		
	1000	46.9	<b>Receiver Height</b>	8		
	1100	45.8	<b>Ground Factor</b>	0.63		
	1200	44.8				
<b>Predicted Noise</b>						
		<b>Level<sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>			
		<b>Crane</b>	77.0			
		<b>Pickup Truck</b>	51.0			
		<b>Generator</b>	79.0			
<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>						
				81.1		

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Erosion Control**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Factor <sup>1</sup>
	100	74.4	<b>Drum Mixer</b>	80	0.5
	200	66.4	<b>Generator</b>	82	0.5
	300	61.8	<b>Hydroseed Truck</b>	80	0.4
	400	58.5			
	500	55.9			
	600	53.9			
	700	52.1			
	800	50.6	<b>Ground Type</b>	Soft	
	900	49.2	<b>Source Height</b>	5	
	1000	48.0	<b>Receiver Height</b>	8	
	1100	46.9	<b>Ground Factor</b>	0.63	
	1200	45.9			
			<b>Predicted Noise</b>		
			<b>Level<sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>	
			<b>Drum Mixer</b>	77.0	
			<b>Generator</b>	79.0	
			<b>Hydroseed Truck</b>	76.0	
			<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>		
					82.3

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Phase 2 Demobilization and Clean Up**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Factor <sup>1</sup>
Threshold*	100	73.6	Pickup Truck	55	0.4
	200	65.6	Front End Loader	80	0.4
	300	61.0	Flat Bed Truck	84	0.4
	400	57.7			
	500	55.1			
	600	53.1			
	700	51.3			
	800	49.8	Ground Type	Soft	
	900	48.4	Source Height	5	
	1000	47.2	Receiver Height	8	
	1100	46.1	Ground Factor	0.63	
	1200	45.1			
<b>Predicted Noise</b>					
				<b>Level<sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>
				Pickup Truck	51.0
				Front End Loader	76.0
				Flat Bed Truck	80.0
<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>					<b>81.5</b>

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

Appendix F  
Haul Truck Trips  
Sutter Pointe Borrow Site

**Assumptions:**

Mean SEL Reference Level	84.0
Assumed Haul Truck Speed (mph)	25.0
Number of Hours for Hauling per Day	10.0
Haul Truck Size in Cubic Yards	15.0
Amount of Haul Material	1,600,000.0
Number of Haul Days	100.0
Amount of Daily Haul Material	16,000.0
Amount of Hourly Haul Material	1,600.0
Number of Trips per Hour-one way	213.3

Leq for Haul Trips at 50 feet 67.2

Appendix F  
Haul Truck Trips  
Pacific Terrace Borrow Site

**Assumptions:**

Mean SEL Reference Level at 50 feet	84.0
Assumed Haul Truck Speed (mph)	25.0
Number of Hours for Hauling per Day	10.0
Haul Truck Size in Cubic Yards	15.0
Amount of Haul Material	550,000.0
Number of Haul Days	31.0
Amount of Daily Haul Material	17,741.9
Amount of Hourly Haul Material	1,774.2
Number of Trips per Hour-one way	236.6

Leq for Haul Trips at 50 feet 67.6

Appendix F  
Haul Truck Trips  
Dunmore Borrow Site

**Assumptions:**

Mean SEL Reference Level at 50 feet	84.0
Assumed Haul Truck Speed (mph)	25.0
Number of Hours for Hauling per Day	10.0
Haul Truck Size in Cubic Yards	15.0
Amount of Haul Material	1,000,000.0
Number of Haul Days	100.0
Amount of Daily Haul Material	10,000.0
Amount of Hourly Haul Material	1,000.0
Number of Trips per Hour-one way	133.3

Leq for Haul Trips at 50 feet 65.1

Appendix F  
Haul Truck Trips  
Krumenacher Borrow Site

**Assumptions:**

Mean SEL Reference Level at 50 feet	84.0
Assumed Haul Truck Speed (mph)	25.0
Number of Hours for Hauling per Day	10.0
Haul Truck Size in Cubic Yards	15.0
Amount of Haul Material	450,000.0
Number of Haul Days	100.0
Amount of Daily Haul Material	4,500.0
Amount of Hourly Haul Material	450.0
Number of Trips per Hour-one way	60.0

Leq for Haul Trips at 50 feet 61.7

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Clearing and Grubbing/Stripping**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Factor <sup>1</sup>
	100	74.6	<b>Dozer</b>	85	0.4
	200	66.7	<b>Front End Loader</b>	80	0.4
	300	62.0	<b>Water Truck</b>	75	0.4
	400	58.7			
	500	56.2			
	600	54.1			
	700	52.3			
	800	50.8	<b>Ground Type</b>	Soft	
	900	49.5	<b>Source Height</b>	5	
	1000	48.3	<b>Receiver Height</b>	8	
	1100	47.2	<b>Ground Factor</b>	0.63	
	1200	46.2			
			<b>Predicted Noise</b>		
			<b>Level <sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>	
			<b>Dozer</b>	81.0	
			<b>Front End Loader</b>	76.0	
			<b>Water Truck</b>	71.0	
			<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>		
			82.5		

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
 SAFCA - Levee Degrading



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Factor <sup>1</sup>
	100	76.7	Scraper	85	0.4
	200	68.8	Front End Loader	80	0.4
	300	64.2	Dozer	85	0.4
	400	60.9			
	500	58.3			
	600	56.2			
	700	54.5			
	800	53.0	Ground Type	Soft	
	900	51.6	Source Height	5	
	1000	50.4	Receiver Height	8	
	1100	49.3	Ground Factor	0.63	
	1200	48.3			
			<b>Predicted Noise</b>		
			<b>Level <sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>	
			Scraper	81.0	
			Front End Loader	76.0	
			Dozer	81.0	
			<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>		
			84.7		

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Demolish Canal and Tree Removal**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage Factor <sup>1</sup>
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	
	100	76.3	<b>Excavator</b>	85	0.4
	200	68.4	<b>Front End Loader</b>	80	0.4
	300	63.8	<b>Dump Truck</b>	84	0.4
	400	60.5			
	500	57.9			
	600	55.8			
	700	54.1			
	800	52.5	<b>Ground Type</b>	Soft	
	900	51.2	<b>Source Height</b>	5	
	1000	50.0	<b>Receiver Height</b>	8	
	1100	48.9	<b>Ground Factor</b>	0.63	
	1200	47.9			
<b>Predicted Noise</b>					
		<b>Level <sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>		
		<b>Excavator</b>	81.0		
		<b>Front End Loader</b>	76.0		
		<b>Dump Truck</b>	80.0		
<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>					
84.3					

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Cutoff Wall Construction**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>		Usage Factor <sup>1</sup>
	100	76.1	<b>Generator</b>	82	0.5	
	200	68.2	<b>Excavator</b>	85	0.4	
	300	63.6	<b>Soil Mix Drill Rig</b>	80	0.5	
	400	60.3				
	500	57.7				
	600	55.7				
	700	53.9				
	800	52.4	<b>Ground Type</b>	Soft		
	900	51.0	<b>Source Height</b>	5		
	1000	49.8	<b>Receiver Height</b>	8		
	1100	48.7	<b>Ground Factor</b>	0.63		
	1200	47.7				
<b>Predicted Noise</b>						
			<b>Level<sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>		
			<b>Generator</b>	79.0		
			<b>Excavator</b>	81.0		
			<b>Soil Mix Drill Rig</b>	77.0		
<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>						
				84.1		

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.



**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Borrow Site Excavation**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Factor <sup>1</sup>
	100	76.3	Excavator	85	0.4
	200	68.4	Front End Loader	80	0.4
	300	63.8	Dump Truck	84	0.4
	400	60.5			
	500	57.9			
	600	55.8			
	700	54.1			
	800	52.5	Ground Type	Soft	
	900	51.2	Source Height	5	
	1000	50.0	Receiver Height	8	
	1100	48.9	Ground Factor	0.63	
	1200	47.9			
			<b>Predicted Noise</b>		
			<b>Level <sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>	
			Excavator	81.0	
			Front End Loader	76.0	
			Dump Truck	80.0	
				<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>	
				84.3	

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Levee Raising**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage Factor <sup>1</sup>
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	
	100	75.7	Front End Loader	80	0.4
	200	67.8	Roller	85	0.2
	300	63.1	Dozer	85	0.4
	400	59.8			
	500	57.3			
	600	55.2			
	700	53.4			
	800	51.9	Ground Type	Soft	
	900	50.5	Source Height	5	
	1000	49.3	Receiver Height	8	
	1100	48.3	Ground Factor	0.63	
	1200	47.3			
			<b>Predicted Noise</b>		
			<b>Level <sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>	
			Front End Loader	76.0	
			Roller	78.0	
			Dozer	81.0	
			<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>		
					83.6

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Surface Drainage Outlets**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Factor <sup>1</sup>
	100	75.7	<b>Backhoe</b>	80	0.4
	200	67.8	<b>Paver</b>	85	0.5
	300	63.1	<b>Concrete Pump Truck</b>	82	0.2
	400	59.8			
	500	57.3			
	600	55.2			
	700	53.4			
	800	51.9	<b>Ground Type</b>	Soft	
	900	50.6	<b>Source Height</b>	5	
	1000	49.3	<b>Receiver Height</b>	8	
	1100	48.3	<b>Ground Factor</b>	0.63	
	1200	47.3			
			<b>Predicted Noise</b>		
			<b>Level<sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>	
			<b>Backhoe</b>	76.0	
			<b>Paver</b>	82.0	
			<b>Concrete Pump Truck</b>	75.0	
			<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>		
			83.6		

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Construct Relief Wells and Drainage Canals**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	Usage Factor <sup>1</sup>
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	
Threshold*	100	73.7	<b>Drill Rig Truck</b>	84	0.2
	200	65.8	<b>Roller</b>	85	0.2
	300	61.1	<b>Concrete Pump Truck</b>	82	0.2
	400	57.8			
	500	55.3			
	600	53.2			
	700	51.4			
	800	49.9	<b>Ground Type</b>	Soft	
	900	48.6	<b>Source Height</b>	5	
	1000	47.4	<b>Receiver Height</b>	8	
	1100	46.3	<b>Ground Factor</b>	0.63	
	1200	45.3			
<b>Predicted Noise</b>					
		<b>Level<sup>2</sup></b>	<b>L<sub>eq</sub> dBA at 50 feet<sup>2</sup></b>		
		<b>Drill Rig Truck</b>	77.0		
		<b>Roller</b>	78.0		
		<b>Concrete Pump Truck</b>	75.0		
<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>					
				81.6	

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

**Appendix F**  
**Project-Generated Construction Source Noise Prediction Model**  
**SAFCA - Site Restoration and Demobilization**



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level ( $L_{eq}$ dBA)	Assumptions:	Reference Emission	Usage Factor <sup>1</sup>
				Noise Levels ( $L_{max}$ ) at 50 feet <sup>1</sup>	
	100	75.9	Dump Truck	84	0.4
	200	68.0	Flat Bed Truck	84	0.4
	300	63.3	Hydroseed Truck	80	0.4
	400	60.0			
	500	57.5			
	600	55.4			
	700	53.6			
	800	52.1	Ground Type	Soft	
	900	50.8	Source Height	5	
	1000	49.6	Receiver Height	8	
	1100	48.5	Ground Factor	0.63	
	1200	47.5			
<b>Predicted Noise</b>					
			<b>Level<sup>2</sup></b>	<b><math>L_{eq}</math> dBA at 50 feet<sup>2</sup></b>	
			Dump Truck	80.0	
			Flat Bed Truck	80.0	
			Hydroseed Truck	76.0	
<b>Combined Predicted Noise Level (<math>L_{eq}</math> dBA at 50 feet)</b>					
				83.8	

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(\text{U.F.}) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

## Appendix F

SAFCA Levee Improvement Project  
Levee Work  
Summary of Predicted Action Noise Levels

Action	Leq	Distance to Noise Contours in feet	
		50 dBA Contour	45 dBA Contour
SAFCA - Clearing and Grubbing/Stripping	74.6	1698.8	3021.0
SAFCA - Levee Degrading	76.7	2172.6	3863.4
SAFCA - Demolish Canal and Tree Removal	76.3	2073.9	3687.9
SAFCA - Cutoff Wall Construction	76.1	2029.8	3609.5
SAFCA - Borrow Site Excavation	76.3	2073.9	3687.9
SAFCA - Levee Raising	75.7	1923.8	3421.1
SAFCA - Surface Drainage Outlets	75.7	1924.2	3421.7
SAFCA - Construct Relief Wells and Drainage Canals	73.7	1529.4	2719.6
SAFCA - Site Restoration and Demobilization	75.9	1970.2	3503.6

Appendix F  
Haul Truck Trips  
Sutter Pointe Borrow Site

**Assumptions:**

Mean SEL Reference Level	84.0
Assumed Haul Truck Speed (mph)	25.0
Number of Hours for Hauling per Day	10.0
Haul Truck Size in Cubic Yards	15.0
Amount of Haul Material	1,600,000.0
Number of Haul Days	100.0
Amount of Daily Haul Material	16,000.0
Amount of Hourly Haul Material	1,600.0
Number of Trips per Hour-one way	213.3

Leq for Haul Trips at 50 feet 67.2

Appendix F  
Haul Truck Trips  
Pacific Terrace Borrow Site

**Assumptions:**

Mean SEL Reference Level at 50 feet	84.0
Assumed Haul Truck Speed (mph)	25.0
Number of Hours for Hauling per Day	10.0
Haul Truck Size in Cubic Yards	15.0
Amount of Haul Material	550,000.0
Number of Haul Days	31.0
Amount of Daily Haul Material	17,741.9
Amount of Hourly Haul Material	1,774.2
Number of Trips per Hour-one way	236.6

Leq for Haul Trips at 50 feet 67.6

Appendix F  
Haul Truck Trips  
Dunmore Borrow Site

**Assumptions:**

Mean SEL Reference Level at 50 feet	84.0
Assumed Haul Truck Speed (mph)	25.0
Number of Hours for Hauling per Day	10.0
Haul Truck Size in Cubic Yards	15.0
Amount of Haul Material	1,000,000.0
Number of Haul Days	100.0
Amount of Daily Haul Material	10,000.0
Amount of Hourly Haul Material	1,000.0
Number of Trips per Hour-one way	133.3

Leq for Haul Trips at 50 feet 65.1

Appendix F  
Haul Truck Trips  
Krumenacher Borrow Site

**Assumptions:**

Mean SEL Reference Level at 50 feet	84.0
Assumed Haul Truck Speed (mph)	25.0
Number of Hours for Hauling per Day	10.0
Haul Truck Size in Cubic Yards	15.0
Amount of Haul Material	450,000.0
Number of Haul Days	100.0
Amount of Daily Haul Material	4,500.0
Amount of Hourly Haul Material	450.0
Number of Trips per Hour-one way	60.0

Leq for Haul Trips at 50 feet 61.7