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**APPENDIX B2-3**

**Emission Calculations for BNSF Undercrossing  
Alternative**

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## Emissions Summaries

### Criteria Emissions

Segment	Category	Criteria Emissions (lbs/d)				
		ROG	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Alternate	Offroad equipment	0.485	3.140	2.739	0.106	0.106
	Onroad trucks	0.002	0.024	0.034	0.005	0.002
	Employees	0.003	0.179	0.011	0.012	0.005
<b>Maximum Daily</b>		<b>0.49</b>	<b>3.34</b>	<b>2.78</b>	<b>0.12</b>	<b>0.11</b>

### GHG Emissions

Segment	Category	GHG Emissions (tonnes)			
		CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> e
Alternate	Offroad equipment	5.411	0.00059	N/A	5.425
	Onroad trucks	0.463	0.00000	0.00003	0.471
	Employees	0.988	0.00001	0.00002	0.993
<b>Total for Alternate</b>		<b>6.86</b>	<b>0.0006</b>	<b>0.0000</b>	<b>6.89</b>

# Employees

## Segment Q Employees

Activity	Activity					Criteria Emissions (lbs/d)					GHG Emissions (tonnes)			
	# of days	# of employees	Round Trip	VMT/ day	total VMT	ROG	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> e
Alternate	30	6	20	120	3,600	0.003	0.179	0.011	0.012	0.005	0.988	0.00001	0.00002	0.993
<i>Alternate Totals</i>						<i>0.003</i>	<i>0.179</i>	<i>0.011</i>	<i>0.012</i>	<i>0.005</i>	<i>0.988</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.993</i>

# Onroad Trucks

## Segment Q - Onroad Trucks

Activity	Truck Type	Activity					Criteria Emissions (lbs/d)					GHG Emissions (tonnes)			
		# of days	Trucks /day	Round Trip	VMT/day	total VMT	ROG	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2e</sub>
Alternate	dump truck	30	1	24	24	720	0.002	0.024	0.034	0.005	0.002	0.463	0.00000	0.00003	0.471
<i>Alternate Totals</i>							<i>0.002</i>	<i>0.024</i>	<i>0.034</i>	<i>0.005</i>	<i>0.002</i>	<i>0.463</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.47</i>

## Offroad Equipment

### Segment Q - Offroad Equipment

Activity	Equipment Type	Activity						Criteria Emissions (lbs/d)					GHG Emissions (tonnes)		
		BHP	Load Factor	# of days	# of pieces	hrs / day	total hours	ROG	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	CO <sub>2e</sub>
Alternate	concrete mixer	9	0.56	30	1	6	180	0.044	0.231	0.276	0.011	0.011	0.516	0.00005	0.52
	loader	97	0.37	30	1	8	240	0.441	2.909	2.463	0.096	0.096	4.895	0.00053	4.91
	<b>Alternate Totals</b>							<b>0.49</b>	<b>3.14</b>	<b>2.74</b>	<b>0.11</b>	<b>0.11</b>	<b>5.41</b>	<b>0.0006</b>	<b>5.43</b>