

Appendix C

# **Air Quality Analysis Assumptions**

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### Construction Equipment Assumptions for Phase 1

Equipment	Number of equipment pieces per phase			
	Grubbing/ land clearing	Grading/ excavation	Drainage/ utilities/sub-grade	Paving
Crawler Tractor	1			
Excavator	1			
Crawler Tractor		1		
Excavator		1		
Grader		1		
Roller		1		
Loader		1		
Scraper				
Tractors/Backhoe		1		
Air Compressor			1	
Generator Set			1	
Grader			1	
Plate Compactor			1	
Pump				
Forklift				
Tractors/Backhoe			1	
Pavers				1
Paving Equipment				1
Rollers				2
Tractors/Backhoe				1

### Construction Modeling Assumptions for Phase 1

Assumption	Project
Construction start date (year)	2020
Number of months of construction	6.5
Project length (miles)	1.5
Total project area (acres)	11.5
Use of water trucks	Yes
Predominant soil type	Weathered Rock
Duration of construction activities per phase	
1. Grubbing/land clearing	1/2 Month
2. Grading/excavation	2 Month
3. Drainage/utilities/sub-grade	2 Months
4. Paving	2 Months
Soil import/export per phase (Total CYs)	
1. Grubbing/land clearing	400 CY
2. Grading/excavation	16,000 CY
3. Drainage/utilities/sub-grade	650 CY
Asphalt import/export per phase	
4. Paving	6,300 CY

**Construction Equipment Assumptions for the Proposed Project and Alternative 1 (Phase 2)**

Equipment	Number of equipment pieces per phase			
	Grubbing/ land clearing	Grading/ excavation	Drainage/ utilities/sub-grade	Paving
Crawler Tractor	2			
Excavator	2			
Crawler Tractor		1		
Excavator		1		
Grader		2		
Roller		2		
Loader		1		
Scraper		2		
Tractors/Backhoe		4		
Air Compressor			1	
Generator Set			1	
Grader			1	
Plate Compactor			1	
Pump			1	
Forklift			1	
Tractors/Backhoe			2	
Pavers				1
Paving Equipment				1
Rollers				2
Tractors/Backhoe				2

**Construction Modeling Assumptions for the Proposed Project and Alternative 1 (Phase 2)**

Assumption	Project	Alternative 1
Construction start date (year)	2023	2023
Number of months of construction	13	20
Project length (miles)	0.3 mile	0.3 mile
Total project area (acres)	15 acres	15 acres
Use of water trucks	Yes	Yes
Predominant soil type	Weathered Rock	Weathered Rock
Duration of construction activities per phase		
5. Grubbing/land clearing	1.30 months	2.00 months
6. Grading/excavation	5.85 months	9.00 months
7. Drainage/utilities/sub-grade	3.90 months	6.00 months
8. Paving	1.95 months	3.00 months
Soil import/export per phase (Total CY's)		
5. Grubbing/land clearing	180 cubic yards	180 cubic yards
6. Grading/excavation	92,000 cubic yards	91,000 cubic yards
7. Drainage/utilities/sub-grade	2,000 cubic yards	2,000 cubic yards
Asphalt import/export per phase		
8. Paving	21,900 cubic yards	23,200 cubic yards
Bridge demolition (cubic yards)	850 cubic yards	850 cubic yards

**Daily VMT Distribution by Speed Bin**

Speed		2016	2016 Plus Project	2035 No Project	2035 Plus Project
>0	<=5	59,504	60,825	142,743	142,894
>5	<=10	215,738	214,724	454,007	455,659
>10	<=15	557,270	555,540	813,036	841,270
>15	<=20	6,322,369	6,313,951	9,592,960	9,479,274
>20	<=25	2,681,083	2,680,514	5,213,647	5,333,591
>25	<=30	3,135,781	3,187,792	4,700,428	4,700,826
>30	<=35	4,763,307	4,780,631	8,342,685	8,266,886
>35	<=40	5,113,326	5,041,862	11,628,882	11,662,611
>40	<=45	4,959,185	4,954,825	7,055,879	7,054,600
>45	<=50	5,380,232	5,397,389	7,706,144	7,627,113
>50	<=55	10,238,611	10,235,833	8,548,859	8,659,579
>55	<=60	5,277,378	5,290,272	5,855,494	5,829,879
>60	<=65	1,521,616	1,517,241	3,723,569	3,724,924
>65	<=70	1,873,052	1,872,721	212,251	212,259
>70	<=75	0	0	0	0
>75		0	0	0	0
<b>Total</b>		<b>52,098,452</b>	<b>52,104,120</b>	<b>73,990,584</b>	<b>73,991,365</b>

**CTEMFAC2017 Emission Factors, grams per mile (2035)**

Speed	ROG	CO	NOx	CO2	CH4	N2O	PM10	PM2.5
0-5	0.40	3.06	1.03	975.05	0.06	0.05	0.21	0.07
5-10	0.28	2.59	0.88	800.00	0.04	0.04	0.21	0.06
10-15	0.18	2.21	0.70	647.17	0.03	0.03	0.20	0.06
15-20	0.12	1.94	0.60	539.85	0.02	0.03	0.19	0.05
20-25	0.09	1.73	0.55	464.51	0.02	0.02	0.19	0.05
25-30	0.07	1.57	0.52	413.64	0.01	0.02	0.19	0.05
30-35	0.06	1.45	0.50	384.08	0.01	0.02	0.19	0.05
35-40	0.05	1.35	0.49	369.86	0.01	0.02	0.19	0.05
40-45	0.05	1.27	0.48	367.95	0.01	0.02	0.19	0.05
45-50	0.05	1.21	0.48	376.29	0.01	0.02	0.19	0.05
50-55	0.05	1.17	0.49	389.92	0.01	0.02	0.19	0.05
55-60	0.05	1.17	0.51	404.64	0.01	0.02	0.19	0.05
60-65	0.06	1.19	0.53	417.75	0.01	0.02	0.19	0.05
65-70	0.06	1.23	0.53	420.97	0.01	0.02	0.19	0.05
70-75	0.06	1.23	0.53	420.97	0.01	0.02	0.19	0.05

**CTEMFAC2017 Emission Factors, grams per mile (2016)**

<b>Speed</b>	<b>ROG</b>	<b>CO</b>	<b>NOx</b>	<b>CO2</b>	<b>CH4</b>	<b>N2O</b>	<b>PM10</b>	<b>PM2.5</b>
0-5	0.09	1.05	0.66	648.04	0.02	0.03	0.20	0.05
5-10	0.06	0.89	0.51	529.54	0.01	0.03	0.19	0.05
10-15	0.04	0.74	0.37	426.96	0.01	0.02	0.19	0.04
15-20	0.03	0.65	0.29	357.37	0.01	0.02	0.19	0.04
20-25	0.02	0.58	0.24	307.34	0.01	0.02	0.19	0.04
25-30	0.02	0.53	0.19	272.26	0.00	0.02	0.19	0.04
30-35	0.01	0.49	0.14	250.77	0.00	0.01	0.19	0.04
35-40	0.01	0.45	0.11	239.77	0.00	0.01	0.19	0.04
40-45	0.01	0.42	0.09	237.38	0.00	0.01	0.19	0.04
45-50	0.01	0.40	0.08	242.19	0.00	0.01	0.19	0.04
50-55	0.01	0.38	0.09	251.45	0.00	0.01	0.19	0.04
55-60	0.01	0.37	0.10	262.81	0.00	0.01	0.19	0.04
60-65	0.01	0.37	0.12	274.67	0.00	0.01	0.19	0.04
65-70	0.01	0.37	0.12	276.67	0.00	0.01	0.19	0.04
70-75	0.01	0.37	0.12	276.67	0.00	0.01	0.19	0.04