

Appendix B

Emissions Calculations

Assumptions

Estimated Construction Schedule & Annual Durations

Part of Project	Work Months	Days	Years	Approximate Start Date	Approximate End Date	No of Days 2029	No of Days 2030
Staging Areas	3	100	1	3/11/2029	7/5/2029	100	0
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	14	366	1.166666667	4/1/2029	6/1/2030	235	131
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	14	366	1.166666667	4/1/2029	6/1/2030	235	131
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	11	288	1	5/1/2029	4/1/2030	210	78
Civil Crew (Road Maintenance, BMP's, Gates)	19	515	1.583333333	3/11/2029	11/1/2030	253	262
Structure Installation - Lattice - Guyed V Framing	11	287	1	6/1/2029	5/1/2030	183	104
Structure Installation - Lattice - Guyed V Setting	11	287	1	6/1/2029	5/1/2030	183	104
Structure Installation - Monopole and Lattice - 4-Legged	11	287	1	6/1/2029	5/1/2030	183	104
Structure Installation - Spotting	11	287	1	6/1/2029	5/1/2030	183	104
Conductor and Wires Installation	11	287	1	11/1/2029	10/1/2030	52	235
Civil Crew (Clean Up)	8	211	1	3/1/2030	11/1/2030	0	211

Notes: If the duration for a given phase is less than one year, it was assumed to occur over one year for the purpose of converting lifetime emissions to annual averages. Start and end date for each construction phase was taken from Table 3.9 of the Project Description to determine phase duration. Construction was assumed to occur Monday through Saturday.

Construction Schedule and Total Duration (for use in Figure)

Part of Project	Approximate Start Date	Approximate End Date	Duration
Staging Areas	3/11/2029	7/5/2029	100
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	4/1/2029	6/1/2030	366
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	4/1/2029	6/1/2030	366
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	5/1/2029	4/1/2030	288
Civil Crew (Road Maintenance, BMP's, Gates)	3/11/2029	11/1/2030	515
Structure Installation - Lattice - Guyed V Framing	6/1/2029	5/1/2030	287
Structure Installation - Lattice - Guyed V Setting	6/1/2029	5/1/2030	287
Structure Installation - Monopole and Lattice - 4-Legged	6/1/2029	5/1/2030	287
Structure Installation - Spotting	6/1/2029	5/1/2030	287
Conductor and Wires Installation	11/1/2029	10/1/2030	287
Civil Crew (Clean Up)	3/1/2030	11/1/2030	211

Estimated Construction Equipment Counts for All Crews & Usage Days by Phase

Identifier	Equipment	HP	Specific Name	Phase	Total Equipment Count for All Crews	Total No. of Usage Days	No. of Usage Days - 2029	No. of Usage Days - 2030
R/T Forklift Staging A	Forklifts (medium)	96	R/T Forklift	Staging Areas	4	100	100	-
Generator Staging Ar	Generator Sets	45	Generator	Staging Areas	1	100	100	-
Water Truck Staging	Off-Highway Trucks	350	Water Truck	Staging Areas	1	100	100	-
GRADER 150 AWD Ci	Graders	200	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
DOZER D6 Civil Crew	Rubber Tired Dozers (medium)	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
Water Truck Civil Cre	Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
ROLLER Civil Crew (R	Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
EXCAVATOR>100,000	Excavators (heavy)	450	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
DOZER D6 Civil Crew	Rubber Tired Dozers (medium)	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Water Truck Civil Cre	Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
ROLLER Civil Crew (R	Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
IMT Drill Civil Crew (I	Bore/Drill Rigs	500	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
LoDril Civil Crew (Ro	Bore/Drill Rigs	400	LoDril	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
Backhoe Civil Crew (I	Tractors/Loaders/Backhoes	150	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	288	210	78
CRANE 40T Civil Crev	Cranes (heavy)	425	CRANE 40T	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	288	210	78
Material Handler Civ	Other Material Handling Equipment	400	Material Handler	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
SKID STEER & FORKS	Forklifts (Heavy)	100	SKID STEER & FORKS	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
Water Truck Civil Cre	Off-Highway Trucks	350	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	515	253	262
GRADER 150 AWD Ci	Graders	200	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
SKID STEER & FORKS	Forklifts (Heavy)	100	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
Mechanic Truck Civil	Off-Highway Trucks	335	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
FORKLIFT 12K Struct	Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	4	287	183	104
CRANE 275 TON Stru	Cranes (heavy)	500	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
EXCAVATOR>60,000	Excavators (medium)	175	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
FORKLIFT 12K Struct	Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
FORKLIFT 12K Struct	Forklifts	100	FORKLIFT 12K	Structure Installation - Monopole and Lattice - 4-Legged	1	287	183	104
CRANE 160 TON RT S	Cranes	500	CRANE 160 TON RT	Structure Installation - Monopole and Lattice - 4-Legged	1	287	183	104
FORKLIFT 12K Struct	Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Spotting	1	287	183	104
CRANE 100 TON RT S	Cranes (medium)	270	CRANE 100 TON RT	Structure Installation - Spotting	1	287	183	104
DOZER D8 TRIPLE BU	Rubber Tired Dozers (heavy)	350	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation	4	287	52	235
DOZER D6 SINGLE TC	Rubber Tired Dozers (medium)	200	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	2	287	52	235
HARDLINE PULLER C	Other Construction Equipment	500	HARDLINE PULLER	Conductor and Wires Installation	4	287	52	235
TRIPLE DRUM PULLER	Other Construction Equipment (medium)	175	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation	6	287	52	235
TENSIONER 72" BND	Other Construction Equipment	300	TENSIONER 72" BNDL TRK MNTD	Conductor and Wires Installation	2	287	52	235
FORKLIFT 12K Condu	Forklifts (Heavy)	100	FORKLIFT 12K	Conductor and Wires Installation	4	287	52	235
7 TON ARMY BUNK T	Off-Highway Trucks	400	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	4	287	52	235
BUCKET TRUCK 90'-1	Off-Highway Trucks	300	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	2	287	52	235
CRANE 40T Conduct	Cranes (heavy)	425	CRANE 40T	Conductor and Wires Installation	11	287	52	235
SKID STEER & FORKS	Forklifts (Heavy)	100	SKID STEER & FORKS	Conductor and Wires Installation	2	287	52	235
Mechanic Truck Con	Off-Highway Trucks	335	Mechanic Truck	Conductor and Wires Installation	2	287	52	235
EXCAVATOR>100,000	Excavators (heavy)	450	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	211	-	211

Estimated Regional Construction Equipment Counts per Crew & Usage Days by Phase

Identifier	Equipment	HP	Specific Name	Phase	No. of Equipment per Crew	Total No. of Usage Days	No. of Usage Days - 2029	No. of Usage Days - 2030
R/T Forklift Staging Areas	Forklifts (medium)	96	R/T Forklift	Staging Areas	4	100	100	-
Generator Staging Areas	Generator Sets	45	Generator	Staging Areas	1	100	100	-
Water Truck Staging Areas	Off-Highway Trucks	350	Water Truck	Staging Areas	1	100	100	-
GRADER 150 AWD Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Graders	200	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
DOZER D6 Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Rubber Tired Dozers (medium)	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
Water Truck Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
ROLLER Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
EXCAVATOR>100,000 LBS Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Excavators (heavy)	450	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
DOZER D6 Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Rubber Tired Dozers (medium)	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Water Truck Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
ROLLER Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
IMT Drill Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bore/Drill Rigs	500	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
LoDril Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bore/Drill Rigs	400	LoDril	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
Backhoe Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Tractors/Loaders/Backhoes	150	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	288	210	78
CRANE 40T Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Cranes (heavy)	425	CRANE 40T	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	288	210	78
Material Handler Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Other Material Handling Equipment	400	Material Handler	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
SKID STEER & FORKS Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Forklifts (Heavy)	100	SKID STEER & FORKS	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
Water Truck Civil Crew (Road Maintenance, BMP's, Gates)	Off-Highway Trucks	350	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	515	253	262
GRADER 150 AWD Civil Crew (Road Maintenance, BMP's, Gates)	Graders	200	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
SKID STEER & FORKS Civil Crew (Road Maintenance, BMP's, Gates)	Forklifts (Heavy)	100	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
Mechanic Truck Civil Crew (Road Maintenance, BMP's, Gates)	Off-Highway Trucks	335	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
FORKLIFT 12K Structure Installation - Lattice - Guyed V Framing	Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	4	287	183	104
CRANE 275 TON Structure Installation - Lattice - Guyed V Setting	Cranes (heavy)	500	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
EXCAVATOR>60,000 LBS Structure Installation - Lattice - Guyed V Setting	Excavators (medium)	175	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
FORKLIFT 12K Structure Installation - Lattice - Guyed V Setting	Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
FORKLIFT 12K Structure Installation - Monopole and Lattice - 4-Legged	Forklifts	100	FORKLIFT 12K	Structure Installation - Monopole and Lattice - 4-Legged	6	287	183	104
CRANE 160 TON RT Structure Installation - Monopole and Lattice - 4-Legged	Cranes	500	CRANE 160 TON RT	Structure Installation - Monopole and Lattice - 4-Legged	6	287	183	104
FORKLIFT 12K Structure Installation - Spotting	Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Spotting	1	287	183	104
CRANE 100 TON RT Structure Installation - Spotting	Cranes (medium)	270	CRANE 100 TON RT	Structure Installation - Spotting	1	287	183	104
DOZER D8 TRIPLE BUNDEL SAG Conductor and Wires Installation	Rubber Tired Dozers (heavy)	350	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation	4	287	52	235
DOZER D6 SINGLE TOW WINCH Conductor and Wires Installation	Rubber Tired Dozers (medium)	200	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	2	287	52	235
HARDLINE PULLER Conductor and Wires Installation	Other Construction Equipment	500	HARDLINE PULLER	Conductor and Wires Installation	4	287	52	235
TRIPLE DRUM PULLER 3/8 Conductor and Wires Installation	Other Construction Equipment (medium)	175	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation	6	287	52	235
TENSIONER 72" BNDL TRK MNTD Conductor and Wires Installation	Other Construction Equipment	300	TENSIONER 72" BNDL TRK MNTD	Conductor and Wires Installation	2	287	52	235
FORKLIFT 12K Conductor and Wires Installation	Forklifts (Heavy)	100	FORKLIFT 12K	Conductor and Wires Installation	4	287	52	235
7 TON ARMY BUNK TRUCK Conductor and Wires Installation	Off-Highway Trucks	400	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	4	287	52	235
BUCKET TRUCK 90'-100' AWD Conductor and Wires Installation	Off-Highway Trucks	300	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	2	287	52	235
CRANE 40T Conductor and Wires Installation	Cranes (heavy)	425	CRANE 40T	Conductor and Wires Installation	11	287	52	235
SKID STEER & FORKS Conductor and Wires Installation	Forklifts (Heavy)	100	SKID STEER & FORKS	Conductor and Wires Installation	2	287	52	235
Mechanic Truck Conductor and Wires Installation	Off-Highway Trucks	335	Mechanic Truck	Conductor and Wires Installation	2	287	52	235
EXCAVATOR>100,000 LBS Civil Crew (Clean Up)	Excavators (heavy)	450	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	211	-	211

Estimated Localized Construction Equipment Counts per Crew & Usage

Equipment	HP	Specific Name	Phase	No. of Equipment per Crew	Total No. of Usage Days	No. of Usage Days - 2029
Forklifts (medium)	96	R/T Forklift	Staging Areas	4	100	100
Generator Sets	45	Generator	Staging Areas	1	100	100
Off-Highway Trucks	350	Water Truck	Staging Areas	1	100	100
Graders	200	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	366	235
Rubber Tired Dozers (medium)	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	366	235
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	366	235
Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	366	235
Excavators (heavy)	450	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235
Rubber Tired Dozers (medium)	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1		235
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1		235
Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1		235
Bore/Drill Rigs	500	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	288	210
Bore/Drill Rigs	400	LoDril	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	288	210
Tractors/Loaders/Backhoes	150	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2	288	210
Cranes (heavy)	425	CRANE 40T	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2	288	210
Other Material Handling Equipment	400	Material Handler	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	288	210
Forklifts (Heavy)	100	SKID STEER & FORKS	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	288	210
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	515	253
Graders	200	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253
Forklifts (Heavy)	100	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253
Off-Highway Trucks	335	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253
Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	1	287	183
Cranes (heavy)	500	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	1	287	183
Excavators (medium)	175	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting	1	287	183
Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	1	287	183
Forklifts	100	FORKLIFT 12K	Structure Installation - Monopole and Lattice - 4-Legged	1	287	183
Cranes	500	CRANE 160 TON RT	Structure Installation - Monopole and Lattice - 4-Legged	1	287	183
Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Spotting	1	287	183
Cranes (medium)	270	CRANE 100 TON RT	Structure Installation - Spotting	1	287	183
Rubber Tired Dozers (heavy)	350	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation	2	287	52
Rubber Tired Dozers (medium)	200	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	1	287	52
Other Construction Equipment	500	HARDLINE PULLER	Conductor and Wires Installation	2	287	52
Other Construction Equipment (medium)	175	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation	3	287	52
Other Construction Equipment	300	TENSIONER 72" BNDL TRK MNTD	Conductor and Wires Installation	1	287	52
Forklifts (Heavy)	100	FORKLIFT 12K	Conductor and Wires Installation	2	287	52
Off-Highway Trucks	400	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	2	287	52
Off-Highway Trucks	300	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	1	287	52
Cranes (heavy)	425	CRANE 40T	Conductor and Wires Installation	6	287	52
Forklifts (Heavy)	100	SKID STEER & FORKS	Conductor and Wires Installation	1	287	52
Off-Highway Trucks	335	Mechanic Truck	Conductor and Wires Installation	1	287	52
Excavators (heavy)	450	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	211	-

Onroad Equipment Usage for All Crews

Primary Equipment Description	Phase	Total Equipment Count for All Crews	Fuel Type
1-Ton Truck, 4x4	Staging Areas	4	Diesel
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	3	Gas
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	2	Gas
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	12	Gas
Semi	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2	Diesel
PICKUP 3/4 TON	Civil Crew (Road Maintenance, BMP's, Gates)	2	Diesel
PICKUP 3/4 TON	Structure Installation - Lattice - Guyed V Framing	4	Diesel
PICKUP 1 TON DIESEL	Structure Installation - Lattice - Guyed V Framing	4	Diesel
PICKUP 3/4 TON	Structure Installation - Lattice - Guyed V Setting	4	Gas
PICKUP WINCH TRUCK	Structure Installation - Lattice - Guyed V Setting	8	Diesel
PICKUP 3/4 TON	Structure Installation - Monopole and Lattice - 4-Legged	9	Gas
PICKUP 1 TON DIESEL	Structure Installation - Monopole and Lattice - 4-Legged	3	Diesel
Semi	Structure Installation - Spotting	3	Diesel
PICKUP 1 TON DIESEL	Structure Installation - Spotting	1	Diesel
PICKUP 3/4 TON	Structure Installation - Spotting	1	Diesel
SEMI - ON ROAD	Conductor and Wires Installation	6	Diesel
SEMI - ON ROAD	Conductor and Wires Installation	6	Diesel
SEMI - ON/OFF ROAD 6X6	Conductor and Wires Installation	4	Diesel
PICKUP 1 TON DIESEL	Conductor and Wires Installation	4	Diesel
PICKUP 3/4 TON DIESEL	Conductor and Wires Installation	32	Gas
PICKUP WINCH TRUCK	Conductor and Wires Installation	20	Diesel
PICKUP 3/4 TON	Civil Crew (Clean Up)	2	Gas

Phase	Primary Equipment Description	EMFAC Classification	Fuel Type	Trips per Day
Staging Areas	1-Ton Truck, 4x4	HHDT	Diesel	8
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	Gas	6
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	Gas	4
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	Gas	24
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	Diesel	4
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	Diesel	4
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	Diesel	8
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	Diesel	8
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	Gas	8
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	Diesel	16
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	Gas	18
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	Diesel	6
Structure Installation - Spotting	Semi	HHDT	Diesel	6
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	Diesel	2
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	Diesel	2
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	12
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	12
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	Diesel	8
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	Diesel	8
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	Gas	64
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	Diesel	40
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	Gas	4
Staging Areas	Worker	LHDT2	Gas	12
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	Gas	8
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	Gas	10
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	Gas	14
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	Gas	20
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	Gas	6
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	Gas	10
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	Gas	8
Structure Installation - Spotting	Worker	LHDT2	Gas	10
Conductor and Wires Installation	Worker	LHDT2	Gas	11
Civil Crew (Clean Up)	Worker	LHDT2	Gas	20
Staging Areas	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	Diesel	7
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	Diesel	12
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	Diesel	12
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	Diesel	12
Structure Installation - Spotting	Hauling	HHDT	Diesel	12
Conductor and Wires Installation	Hauling	HHDT	Diesel	2
Civil Crew (Clean Up)	Hauling	HHDT	Diesel	2

Notes: 1,250 hauling trips were estimated assuming total material export is 20,000 CY and hauling truck capacity is 16 CY.

Phase	Estimated Workforce/Crew	Total Equipment Count for All Crews	Hauling Trips per Day	Estimated Workforce All
Staging Areas	6	4	1.00	6
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	8	3	1.00	4
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	5	2	1.00	5
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	21	14	1.00	7
Civil Crew (Road Maintenance, BMP's, Gates)	10	2	3.67	10
Structure Installation - Lattice - Guyed V Framing	12	8	6.00	3
Structure Installation - Lattice - Guyed V Setting	20	12	6.00	5
Structure Installation - Monopole and Lattice - 4-Legged	12	12	6.00	4
Structure Installation - Spotting	5	5	6.00	5
Conductor and Wires Installation	16	72	1.00	5
Civil Crew (Clean Up)	10	2	1.00	10

Regional **Onroad Equipment Usage** Per Crew

Phase	Primary Equipment Description	EMFAC Classification	Fuel Type	Trips per Day
Staging Areas	1-Ton Truck, 4x4	HHDT	Diesel	8
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	Gas	6
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	Gas	4
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	Gas	24
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	Diesel	4
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	Diesel	4
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	Diesel	8
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	Diesel	8
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	Gas	8
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	Diesel	16
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	Gas	18
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	Diesel	6
Structure Installation - Spotting	Semi	HHDT	Diesel	6
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	Diesel	2
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	Diesel	2
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	12
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	12
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	Diesel	8
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	Diesel	8
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	Gas	64
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	Diesel	40
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	Gas	4
Staging Areas	Worker	LHDT2	Gas	12
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	Gas	16
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	Gas	10
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	Gas	42
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	Gas	20
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	Gas	24
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	Gas	40
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	Gas	24
Structure Installation - Spotting	Worker	LHDT2	Gas	32
Conductor and Wires Installation	Worker	LHDT2	Gas	160
Civil Crew (Clean Up)	Worker	LHDT2	Gas	20
Staging Areas	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	Diesel	7
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	Diesel	12
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	Diesel	12
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	Diesel	12
Structure Installation - Spotting	Hauling	HHDT	Diesel	12
Conductor and Wires Installation	Hauling	HHDT	Diesel	2
Civil Crew (Clean Up)	Hauling	HHDT	Diesel	2

Notes: 1,250 hauling trips were estimated assuming total material export is 20,000 CY and hauling truck capacity is 16 CY.

Phase	Estimated Workforce	Onroad Equipment per Crew	Hauling Trips per Day	Estimated Workforce All
Staging Areas	6		4	1 6
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	8		3	1 8
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	5		2	1 5
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	21		14	1 21
Civil Crew (Road Maintenance, BMP's, Gates)	10		2	4 10
Structure Installation - Lattice - Guyed V Framing	12		8	6 12
Structure Installation - Lattice - Guyed V Setting	20		12	6 20
Structure Installation - Monopole and Lattice - 4-Legged	12		12	6 12
Structure Installation - Spotting	16		5	6 16
Conductor and Wires Installation	80		72	1 80
Civil Crew (Clean Up)	10		2	1 10

It was assumed that 5 trips/day during the Structure Installation subactivity will be required for structure-related transport. Additionally, one additional truck trip per week is anticipated for liquid waste transport.

ID	Primary Equipment Description	Phase	# of Equipment per Crew	Fuel Type
1-Ton Truck, 4x4 Staging Areas	1-Ton Truck, 4x4	Staging Areas	4	Diesel
PICKUP 3/4 TON Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	3	Gas
PICKUP 3/4 TON Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	2	Gas
PICKUP 3/4 TON Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	12	Gas
Semi Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2	Diesel
PICKUP 3/4 TON Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	Civil Crew (Road Maintenance, BMP's, Gates)	2	Diesel
PICKUP 3/4 TON Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	Structure Installation - Lattice - Guyed V Framing	4	Diesel
PICKUP 1 TON DIESEL Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	Structure Installation - Lattice - Guyed V Framing	4	Diesel
PICKUP 3/4 TON Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	Structure Installation - Lattice - Guyed V Setting	4	Gas
PICKUP WINCH TRUCK Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	Structure Installation - Lattice - Guyed V Setting	8	Diesel
PICKUP 3/4 TON Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	Structure Installation - Monopole and Lattice - 4-Legged	9	Gas
PICKUP 1 TON DIESEL Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	Structure Installation - Monopole and Lattice - 4-Legged	3	Diesel
Semi Structure Installation - Spotting	Semi	Structure Installation - Spotting	3	Diesel
PICKUP 1 TON DIESEL Structure Installation - Spotting	PICKUP 1 TON DIESEL	Structure Installation - Spotting	1	Diesel
PICKUP 3/4 TON Structure Installation - Spotting	PICKUP 3/4 TON	Structure Installation - Spotting	1	Diesel
SEMI - ON ROAD Conductor and Wires Installation	SEMI - ON ROAD	Conductor and Wires Installation	6	Diesel
SEMI - ON ROAD Conductor and Wires Installation	SEMI - ON ROAD	Conductor and Wires Installation	6	Diesel
SEMI - ON/OFF ROAD 6X6 Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	Conductor and Wires Installation	4	Diesel
PICKUP 1 TON DIESEL Conductor and Wires Installation	PICKUP 1 TON DIESEL	Conductor and Wires Installation	4	Diesel
PICKUP 3/4 TON DIESEL Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	Conductor and Wires Installation	32	Gas
PICKUP WINCH TRUCK Conductor and Wires Installation	PICKUP WINCH TRUCK	Conductor and Wires Installation	20	Diesel
PICKUP 3/4 TON Civil Crew (Clean Up)	PICKUP 3/4 TON	Civil Crew (Clean Up)	2	Gas

Localized Onroad Equipment Usage Per Crew

Phase	Primary Equipment Description	EMFAC Classification	Fuel Type	Trips per Day
Staging Areas	1-Ton Truck, 4x4	HHDT	Diesel	8
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	Gas	3
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	Gas	4
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	Gas	8
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	Diesel	1
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	Diesel	4
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	Diesel	2
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	Diesel	2
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	Gas	2
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	Diesel	4
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	Gas	6
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	Diesel	2
Structure Installation - Spotting	Semi	HHDT	Diesel	2
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	Diesel	2
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	Diesel	2
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	6
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	6
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	Diesel	4
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	Diesel	4
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	Gas	32
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	Diesel	20
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	Gas	4
Staging Areas	Worker	LHDT2	Gas	12
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	Gas	16
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	Gas	10
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	Gas	42
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	Gas	20
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	Gas	24
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	Gas	40
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	Gas	24
Structure Installation - Spotting	Worker	LHDT2	Gas	10
Conductor and Wires Installation	Worker	LHDT2	Gas	32
Civil Crew (Clean Up)	Worker	LHDT2	Gas	20
Staging Areas	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	Diesel	7
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	Diesel	12
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	Diesel	12
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	Diesel	12
Structure Installation - Spotting	Hauling	HHDT	Diesel	12
Conductor and Wires Installation	Hauling	HHDT	Diesel	2
Civil Crew (Clean Up)	Hauling	HHDT	Diesel	2

Notes: 1,250 hauling trips were estimated assuming total material export is 20,000 CY and hauling truck capacity is 16 CY.

Phase	Estimated Workforce/Crew	Onroad Equipment per Crew	Hauling Trips per Day	Estimated Workforce All
Staging Areas	6		4	1 6
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	8		2	1 4
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	5		2	1 5
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	21		5	1 7
Civil Crew (Road Maintenance, BMP's, Gates)	10		2	4 10
Structure Installation - Lattice - Guyed V Framing	12		2	6 3
Structure Installation - Lattice - Guyed V Setting	20		3	6 5
Structure Installation - Monopole and Lattice - 4-Legged	12		4	6 4
Structure Installation - Spotting	5		3	6 5
Conductor and Wires Installation	16		36	1 5
Civil Crew (Clean Up)	10		2	1 10
It was assumed that 5 trips/day during the Structure Installation subactivity will be required for structure-related transport. Additionally, one additional truck trip per week is anticipated for liquid waste transport.				
ID	Primary Equipment Description	Phase	# of Equipment per Crew	Fuel Type
1-Ton Truck, 4x4 Staging Areas	1-Ton Truck, 4x4	Staging Areas	4	Diesel
PICKUP 3/4 TON Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	Gas
PICKUP 3/4 TON Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	2	Gas
PICKUP 3/4 TON Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	4	Gas
Semi Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	Diesel
PICKUP 3/4 TON Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	Civil Crew (Road Maintenance, BMP's, Gates)	2	Diesel
PICKUP 3/4 TON Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	Structure Installation - Lattice - Guyed V Framing	1	Diesel
PICKUP 1 TON DIESEL Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	Structure Installation - Lattice - Guyed V Framing	1	Diesel
PICKUP 3/4 TON Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	Structure Installation - Lattice - Guyed V Setting	1	Gas
PICKUP WINCH TRUCK Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	Structure Installation - Lattice - Guyed V Setting	2	Diesel
PICKUP 3/4 TON Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	Structure Installation - Monopole and Lattice - 4-Legged	3	Gas
PICKUP 1 TON DIESEL Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	Structure Installation - Monopole and Lattice - 4-Legged	1	Diesel
Semi Structure Installation - Spotting	Semi	Structure Installation - Spotting	1	Diesel
PICKUP 1 TON DIESEL Structure Installation - Spotting	PICKUP 1 TON DIESEL	Structure Installation - Spotting	1	Diesel
PICKUP 3/4 TON Structure Installation - Spotting	PICKUP 3/4 TON	Structure Installation - Spotting	1	Diesel
SEMI - ON ROAD Conductor and Wires Installation	SEMI - ON ROAD	Conductor and Wires Installation	3	Diesel
SEMI - ON ROAD Conductor and Wires Installation	SEMI - ON ROAD	Conductor and Wires Installation	3	Diesel
SEMI - ON/OFF ROAD 6X6 Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	Conductor and Wires Installation	2	Diesel
PICKUP 1 TON DIESEL Conductor and Wires Installation	PICKUP 1 TON DIESEL	Conductor and Wires Installation	2	Diesel
PICKUP 3/4 TON DIESEL Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	Conductor and Wires Installation	16	Gas
PICKUP WINCH TRUCK Conductor and Wires Installation	PICKUP WINCH TRUCK	Conductor and Wires Installation	10	Diesel
PICKUP 3/4 TON Civil Crew (Clean Up)	PICKUP 3/4 TON	Civil Crew (Clean Up)	2	Gas

Offroad Equipment Types & Emission Factors

CalEEMod Name	General Name	CalEEMod Name	HP	Load		g/bhp-hr				
				Factor	ROG	NOx	CO	SO2	PM10E	PM2.5E
Forklifts (medium)	R/T Forklift	Forklifts (medium)	96	0.2	0.21	1.96	3.57	0.005	0.07	0.065
Generator Sets	Generator	Generator Sets	45	0.74	0.275	3.14	3.66	0.007	0.045	0.041
Off-Highway Trucks	Water Truck	Off-Highway Trucks	350	0.38	0.172	0.823	1.16	0.005	0.029	0.027
Graders	GRADER 150 AWD	Graders	200	0.41	0.192	1.56	1.18	0.005	0.054	0.05
Rubber Tired Dozers (medium)	DOZER D6	Rubber Tired Dozers (medium)	200	0.4	0.441	4.44	3.49	0.005	0.201	0.185
Rollers	ROLLER	Rollers	150	0.38	0.107	0.749	2.93	0.005	0.033	0.03
Excavators (heavy)	EXCAVATOR>100,000 LBS	Excavators (heavy)	450	0.38	0.108	0.549	1.04	0.005	0.02	0.018
Bore/Drill Rigs	IMT Drill	Bore/Drill Rigs	500	0.5	0.097	0.703	0.983	0.005	0.026	0.024
Bore/Drill Rigs	LoDril	Bore/Drill Rigs	400	0.5	0.097	0.703	0.983	0.005	0.026	0.024
Tractors/Loaders/Backhoes	Backhoe	Tractors/Loaders/Backhoes	150	0.37	0.145	0.847	3.12	0.005	0.042	0.039
Cranes (heavy)	CRANE 40T	Cranes (heavy)	425	0.29	0.182	1.48	1.61	0.005	0.062	0.057
Other Material Handling Equipment	Material Handler	Other Material Handling Equipment	400	0.4	0.131	0.727	1.16	0.005	0.025	0.023
Forklifts (Heavy)	SKID STEER & FORKS	Forklifts (Heavy)	100	0.2	0.165	1.03	3.18	0.005	0.048	0.044
Cranes (heavy)	CRANE 275 TON	Cranes (heavy)	500	0.29	0.182	1.48	1.61	0.005	0.062	0.057
Excavators (medium)	EXCAVATOR>60,000 LBS	Excavators (medium)	175	0.38	0.124	0.729	1.1	0.005	0.026	0.024
Forklifts (Heavy)	FORKLIFT 12K	Forklifts (Heavy)	100	0.2	0.165	1.03	3.18	0.005	0.048	0.044
Cranes (heavy)	CRANE 160 TON RT	Cranes (heavy)	500	0.29	0.182	1.48	1.61	0.005	0.062	0.057
Cranes (medium)	CRANE 100 TON RT	Cranes (medium)	270	0.29	0.225	2.04	1.41	0.005	0.086	0.079
Rubber Tired Dozers (heavy)	DOZER D8 TRIPLE BUNDEL SAG	Rubber Tired Dozers (heavy)	350	0.4	0.334	2.86	2.63	0.005	0.128	0.118
Rubber Tired Dozers (medium)	DOZER D6 SINGLE TOW WINCH	Rubber Tired Dozers (medium)	200	0.4	0.441	4.44	3.49	0.005	0.201	0.185
Other Construction Equipment	HARDLINE PULLER	Other Construction Equipment	500	0.42	0.145	1.1	1.25	0.005	0.043	0.039
Other Construction Equipment (medium)	TRIPLE DRUM PULLER 3/8	Other Construction Equipment (medi	175	0.42	0.186	1.53	1.34	0.005	0.068	0.062
Other Construction Equipment	TENSIONER 72" BNDL TRK MNTD	Other Construction Equipment	300	0.42	0.145	1.1	1.25	0.005	0.043	0.039
Off-Highway Trucks	7 TON ARMY BUNK TRUCK	Off-Highway Trucks	400	0.38	0.172	0.823	1.16	0.005	0.029	0.027
Off-Highway Trucks	Mechanic Truck	Off-Highway Trucks	335	0.38	0.172	0.823	1.16	0.005	0.029	0.027
Off-Highway Trucks	BUCKET TRUCK 90'-100' AWD	Off-Highway Trucks	300	0.38	0.172	0.823	1.16	0.005	0.029	0.027

CalEEMod Offroad Emission Factors

CalEEMod Offroad Emission Factors (g/bhp-hr)										
Equipment	Fuel	Tier	HP	TOG	ROG	NOx	CO	SO ₂	PM10E	PM2.5E
Forklifts (Medium)	Diesel	Average	75–99.9	0.249	0.21	1.96	3.57	0.005	0.07	0.065
Generator Sets	Diesel	Average	25–49.9	0.332	0.275	3.14	3.66	0.007	0.045	0.041
Off-Highway Trucks	Diesel	Average	300–599.9	0.204	0.172	0.823	1.16	0.005	0.029	0.027
Graders	Diesel	Average	175–299.9	0.229	0.192	1.56	1.18	0.005	0.054	0.05
Rubber Tired Dozers (medium)	Diesel	Average	175–299.9	0.525	0.441	4.44	3.49	0.005	0.201	0.185
Rollers	Diesel	Average	100–174.9	0.128	0.107	0.749	2.93	0.005	0.033	0.03
Excavators (heavy)	Diesel	Average	300–599.9	0.129	0.108	0.549	1.04	0.005	0.02	0.018
Bore/Drill Rigs	Diesel	Average	300–599.9	0.115	0.097	0.703	0.983	0.005	0.026	0.024
Bore/Drill Rigs	Diesel	Average	300–599.9	0.115	0.097	0.703	0.983	0.005	0.026	0.024
Tractors/Loaders/Backhoes	Diesel	Average	100–174.9	0.172	0.145	0.847	3.12	0.005	0.042	0.039
Cranes (heavy)	Diesel	Average	300–599.9	0.216	0.182	1.48	1.61	0.005	0.062	0.057
Other Material Handling Equipment	Diesel	Average	300–599.9	0.156	0.131	0.727	1.16	0.005	0.025	0.023
Forklifts (Heavy)	Diesel	Average	100–174.9	0.196	0.165	1.03	3.18	0.005	0.048	0.044
Cranes (heavy)	Diesel	Average	300–599.9	0.216	0.182	1.48	1.61	0.005	0.062	0.057
Excavators (medium)	Diesel	Average	175–299.9	0.147	0.124	0.729	1.1	0.005	0.026	0.024
Cranes (medium)	Diesel	Average	175–299.9	0.267	0.225	2.04	1.41	0.005	0.086	0.079
Rubber Tired Dozers (heavy)	Diesel	Average	300–599.9	0.398	0.334	2.86	2.63	0.005	0.128	0.118
Other Construction Equipment	Diesel	Average	300–599.9	0.172	0.145	1.1	1.25	0.005	0.043	0.039
Other Construction Equipment (medium)	Diesel	Average	175–299.9	0.221	0.186	1.53	1.34	0.005	0.068	0.062
Other Construction Equipment	Diesel	Average	300–599.9	0.172	0.145	1.1	1.25	0.005	0.043	0.039
Off-Highway Trucks	Diesel	Average	300–599.9	0.204	0.172	0.823	1.16	0.005	0.029	0.027
Off-Highway Trucks	Diesel	Average	300–599.9	0.204	0.172	0.823	1.16	0.005	0.029	0.027
Off-Highway Trucks	Diesel	Average	300–599.9	0.204	0.172	0.823	1.16	0.005	0.029	0.027

Daily Acres Graded by Equipment Type

Equipment	Acres Graded per 8 Hours
Crawler Tractors	0.5
Graders	0.5
Rubber Tired Dozers	0.5
Scrapers	1

Source: CalEEMod Appendix G, Table G-14

Grading Emission Factor (lbs/acre/day)		
Pollutant	PM10	PM2.5
S	7.10	7.10
F	0.60	0.03
Wb	12	12
SF per acre	43,560	43,560
Ft per mile	5,280	5,280
Uncontrolled EF	1.06	0.11
Controlled EF	0.41	0.04

Notes: Grading calculations rely upon this equation (acres graded per day x EF) for Loaders & Scrapers; controlled EF assumes 61% reduction in PM from 2x per day watering.
 Source: CalEEMod Appendix C, Section 4.4.1 (pg C-11)

Bulldozing Emission Factor (lbs/hr)		
Pollutant	PM10	PM2.5
C	1.00	5.70
s	6.90	6.90
M	7.90	7.90
F	0.75	0.11
Uncontrolled EF	0.75	0.41
Controlled EF	0.29	0.16

Notes: Bulldozer calculations rely upon this equation (hours per day x emission factor (EF)) for Dozers; controlled EF assumes 61% reduction in PM from 2x per day watering.
 Source: CalEEMod Appendix C, Section 4.4.2 (pg C-12)

Helicopter Type and Usage

Type	Engine	HP	Fuel Consumption (gallons/hr)
UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	GECT7-2A	4380	133
Bell 407/MD530F (Light Duty)	Alison 250-C20B	420	28

Source: Fuel Consumption is obtained from the U.S. Department of Interior National Business Center (2006)

Helicopter Emission Factors

Helicopter Emission Factor Type	HC	lbs/hr				lbs/gallon	
		NOx	CO	SOx	PM10	CO2	
UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	0.13	10.49	2.02	0.65	0.72	18.355	
Bell 407/MD530F (Light Duty)	0.08	1.75	2.07	0.14	0.1	18.355	

Source: Emission factors for HC, NOx, CO, and SOx were obtained from the California Public Utilities Commission (2007); PM10 emission factors were obtained from the CPUC (2006); and CO2 emission factor for aviation gasoline was obtained from the U.S. Department of Energy (2008).

Note: Emission factors for Sikorsky UH-60A Blackhawk/Boeing CH-47D Chinook were derived from the emission factors for H-53 Super Stallion (T64-GE-416 Turboshift 4,380 hp engine). Emission factors for take-off and climb-out modes were used. Emission factors for Bell 407/MD530F were derived from the emission factors for Bell 206 Jet Ranger (Alison 250-C20 Turboshift 420 hp engine). Emission factors for take-off mode were used.

Helicopter Usage Schedule

Phase	Type	Hours per Day	Number of Helicopters	Total Days of Helicopter Usage		
				No of Days 2029	No of Days 2030	No of Days
Staging Areas	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	100	-
Staging Areas	Bell 407/MD530F (Light Duty)	-	-	-	100	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Bell 407/MD530F (Light Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Bell 407/MD530F (Light Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	210	78
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bell 407/MD530F (Light Duty)	-	-	-	210	78
Civil Crew (Road Maintenance, BMP's, Gates)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	253	262
Civil Crew (Road Maintenance, BMP's, Gates)	Bell 407/MD530F (Light Duty)	-	-	-	253	262
Structure Installation - Lattice - Guyed V Framing	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	6	1	15	183	104
Structure Installation - Lattice - Guyed V Framing	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Lattice - Guyed V Setting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Lattice - Guyed V Setting	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Monopole and Lattice - 4-Legged	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Monopole and Lattice - 4-Legged	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Spotting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Spotting	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Conductor and Wires Installation	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	52	235
Conductor and Wires Installation	Bell 407/MD530F (Light Duty)	5	2	235	52	235
Civil Crew (Clean Up)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	211
Civil Crew (Clean Up)	Bell 407/MD530F (Light Duty)	-	-	-	-	211

Paved Roadway Dust Emission Factors

Paved	PM10 (lb/mile)	PM2.5 (lb/mile)
k	1	0.25
sL	0.1	0.1
W	2.4	2.4
p	2	2
N	365	365
Emission Factor Controlled	0.00030	0.00007
Emission Factor Uncontrolled	0.00066	0.00017

Notes: Used the Controlled emissions factor, which assumes watering twice a day, resulting in a 55% reduction in PM10.
 Source: CalEEMod Appendix C, Section 5.14 (page C-45)

$$EF_{\text{unpaved}} = \left(\frac{k(s/12)^1(S/30)^{0.5}}{(M/0.5)^{0.2}} - C \right) \times \left(1 - \frac{P}{365} \right)$$

Unpaved Roadway Dust Emission Factors

Unpaved	LHDT2 Diesel 25mph		LDT2 Gas 25 mph		HHDT Diesel 15 mph	
	PM10 (lb/mile)	PM2.5 (lb/mile)	PM10 (lb/mile)	PM2.5 (lb/mile)	PM10 (lb/mile)	PM2.5 (lb/mile)
k	816.47	81.65	816.47	81.65	816.47	81.65
sL	8.50	8.50	8.50	8.50	8.50	8.50
M	0.50	0.50	0.50	0.50	0.50	0.50
p	2	2	2	2	2	2
S	40	40	40	40	40	40
C	0.14	0.05	0.09	0.03	0.09	0.03
Emission Factor Controlled (Calculated)	0.37	0.04	0.37	0.04	0.37	0.04
Emission Factor Uncontrolled (CARB Default)	2	0.2	2	0.2	2	0.2
Emission Factor Uncontrolled (Calculated)	1.46	0.15	1.46	0.15	1.46	0.15

Notes: Used the Controlled emissions factor, which assumes watering twice a day, resulting in a 55% reduction in PM10.
 Source: CalEEMod Appendix C, Section 5.14 (page C-45); https://www.caleemod.com/documents/user-guide/04_Appendix%20C.pdf

Regional Daily Air Quality Calculations

Summary of Project Construction Maximum Daily Emissions

Construction Phase	Source	ROG	NOx	CO	SO2	lbs per day	
						PM10	PM2.5
Staging Areas	Off-Road Equipment	0.85	6.43	9.71	0.02	0.07	0.07
Staging Areas	Dust from Material Movement	-	-	-	-	-	-
Staging Areas	On-Road Trip Exhaust (Paved)	0.01	0.14	0.23	0.00	0.04	0.01
Staging Areas	On-Road Trip Exhaust (Unpaved)	0.01	0.36	0.23	0.00	0.02	0.01
Staging Areas	On-Road Roadway Dust (Paved)	-	-	-	-	0.05	0.01
Staging Areas	On-Road Roadway Dust (Unpaved)	-	-	-	-	101.56	10.15
Staging Areas	Helicopter Use	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Off-Road Equipment	2.82	22.41	24.59	0.06	0.36	0.33
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Dust from Material Movement	-	-	-	-	5.52	2.67
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Trip Exhaust (Paved)	0.01	0.05	0.38	0.00	0.03	0.01
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Trip Exhaust (Unpaved)	0.01	0.10	0.30	0.00	0.01	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.04	0.01
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	79.47	7.94
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Helicopter Use	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Off-Road Equipment	1.46	10.60	13.73	0.04	0.17	0.16
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Dust from Material Movement	-	-	-	-	2.56	1.31
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Trip Exhaust (Paved)	0.00	0.04	0.24	0.00	0.02	0.01
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Trip Exhaust (Unpaved)	0.00	0.09	0.20	0.00	0.01	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.03	0.01
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	55.33	5.53
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Helicopter Use	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Off-Road Equipment	6.82	48.26	75.91	0.26	0.76	0.70
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Dust from Material Movement	-	-	-	-	1.24	0.13
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Trip Exhaust (Paved)	0.02	0.16	1.14	0.00	0.08	0.03
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Trip Exhaust (Unpaved)	0.02	0.29	0.91	0.00	0.04	0.01
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.11	0.03
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	238.42	23.83
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Helicopter Use	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Road Equipment	1.93	10.26	13.60	0.06	0.14	0.13
Civil Crew (Road Maintenance, BMP's, Gates)	Dust from Material Movement	-	-	-	-	0.21	0.02
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Trip Exhaust (Paved)	0.01	0.14	0.36	0.00	0.04	0.02
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Trip Exhaust (Unpaved)	0.01	0.31	0.33	0.00	0.02	0.01
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Roadway Dust (Paved)	-	-	-	-	0.05	0.01
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Roadway Dust (Unpaved)	-	-	-	-	120.40	12.04
Civil Crew (Road Maintenance, BMP's, Gates)	Helicopter Use	-	-	-	-	-	-

Ironwood Transmission Construction
 Air Quality Emissions - Maximum Daily

Construction Phase	Source	ROG	NOx	CO	SO2	lbs per day	
						PM10	PM2.5
Structure Installation - Lattice - Guyed V Framing	Off-Road Equipment	0.23	1.45	4.49	0.01	0.03	0.02
Structure Installation - Lattice - Guyed V Framing	Dust from Material Movement	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	On-Road Trip Exhaust (Paved)	0.03	0.29	0.60	0.00	0.08	0.03
Structure Installation - Lattice - Guyed V Framing	On-Road Trip Exhaust (Unpaved)	0.04	0.56	0.56	0.00	0.04	0.02
Structure Installation - Lattice - Guyed V Framing	On-Road Roadway Dust (Paved)	-	-	-	-	0.10	0.03
Structure Installation - Lattice - Guyed V Framing	On-Road Roadway Dust (Unpaved)	-	-	-	-	227.26	22.72
Structure Installation - Lattice - Guyed V Framing	Helicopter Use	0.78	62.94	12.12	3.90	4.32	-
Structure Installation - Lattice - Guyed V Setting	Off-Road Equipment	2.68	20.01	26.12	0.08	0.32	0.30
Structure Installation - Lattice - Guyed V Setting	Dust from Material Movement	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	On-Road Trip Exhaust (Paved)	0.04	0.41	0.89	0.00	0.12	0.05
Structure Installation - Lattice - Guyed V Setting	On-Road Trip Exhaust (Unpaved)	0.06	0.69	0.83	0.00	0.06	0.02
Structure Installation - Lattice - Guyed V Setting	On-Road Roadway Dust (Paved)	-	-	-	-	0.15	0.04
Structure Installation - Lattice - Guyed V Setting	On-Road Roadway Dust (Unpaved)	-	-	-	-	327.82	32.77
Structure Installation - Lattice - Guyed V Setting	Helicopter Use	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Off-Road Equipment	3.14	24.89	31.43	0.09	0.41	0.38
Structure Installation - Monopole and Lattice - 4-Legged	Dust from Material Movement	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Trip Exhaust (Paved)	0.03	0.28	0.76	0.00	0.09	0.03
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Trip Exhaust (Unpaved)	0.03	0.55	0.68	0.00	0.04	0.02
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Roadway Dust (Paved)	-	-	-	-	0.11	0.03
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Roadway Dust (Unpaved)	-	-	-	-	244.38	24.43
Structure Installation - Monopole and Lattice - 4-Legged	Helicopter Use	-	-	-	-	-	-
Structure Installation - Spotting	Off-Road Equipment	0.37	3.18	3.07	0.01	0.05	0.05
Structure Installation - Spotting	Dust from Material Movement	-	-	-	-	-	-
Structure Installation - Spotting	On-Road Trip Exhaust (Paved)	0.03	0.29	0.60	0.00	0.08	0.03
Structure Installation - Spotting	On-Road Trip Exhaust (Unpaved)	0.04	0.56	0.56	0.00	0.04	0.02
Structure Installation - Spotting	On-Road Roadway Dust (Paved)	-	-	-	-	0.10	0.03
Structure Installation - Spotting	On-Road Roadway Dust (Unpaved)	-	-	-	-	226.27	22.62
Structure Installation - Spotting	Helicopter Use	-	-	-	-	-	-

Ironwood Transmission Construction
Air Quality Emissions - Maximum Daily

Construction Phase	Source	ROG	NOx	CO	SO2	lbs per day	
						PM10	PM2.5
Conductor and Wires Installation	Off-Road Equipment	16.79	127.26	137.86	0.42	2.08	1.91
Conductor and Wires Installation	Dust from Material Movement	-	-	-	-	15.33	7.88
Conductor and Wires Installation	On-Road Trip Exhaust (Paved)	0.09	0.99	3.97	0.01	0.37	0.14
Conductor and Wires Installation	On-Road Trip Exhaust (Unpaved)	0.14	1.76	3.35	0.01	0.17	0.06
Conductor and Wires Installation	On-Road Roadway Dust (Paved)	-	-	-	-	0.48	0.12
Conductor and Wires Installation	On-Road Roadway Dust (Unpaved)	-	-	-	-	1,043.15	104.28
Conductor and Wires Installation	Helicopter Use	1.30	17.50	20.70	1.40	1.00	-
Civil Crew (Clean Up)	Off-Road Equipment	0.33	1.66	3.14	0.02	0.02	0.02
Civil Crew (Clean Up)	Dust from Material Movement	-	-	-	-	-	-
Civil Crew (Clean Up)	On-Road Trip Exhaust (Paved)	0.01	0.06	0.41	0.00	0.03	0.01
Civil Crew (Clean Up)	On-Road Trip Exhaust (Unpaved)	0.01	0.10	0.33	0.00	0.01	0.00
Civil Crew (Clean Up)	On-Road Roadway Dust (Paved)	-	-	-	-	0.04	0.01
Civil Crew (Clean Up)	On-Road Roadway Dust (Unpaved)	-	-	-	-	85.51	8.55
Civil Crew (Clean Up)	Helicopter Use	-	-	-	-	-	-

Maximum Daily Emissions		lbs per day					
Construction Phase	Source	ROG	NOx	CO	SO2	PM10	PM2.5
Staging Areas	Total	0.87	6.93	10.17	0.03	101.73	10.25
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Total	2.83	22.56	25.28	0.06	85.43	10.97
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Total	1.47	10.74	14.17	0.04	58.11	7.02
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Total	6.85	48.72	77.97	0.27	240.64	24.73
Civil Crew (Road Maintenance, BMP's, Gates)	Total	1.96	10.70	14.29	0.06	120.87	12.23
Structure Installation - Lattice - Guyed V Framing	Total	1.08	65.24	17.77	3.91	231.83	22.81
Structure Installation - Lattice - Guyed V Setting	Total	2.78	21.11	27.83	0.09	328.46	33.17
Structure Installation - Monopole and Lattice - 4-Legged	Total	3.20	25.72	32.88	0.09	245.03	24.88
Structure Installation - Spotting	Total	0.43	4.03	4.23	0.01	226.55	22.74
Conductor and Wires Installation	Total	18.32	147.52	165.88	1.85	1,062.58	114.39
Civil Crew (Clean Up)	Total	0.34	1.81	3.88	0.02	85.62	8.59
Blasting	Total	1	13	33	1	97	6
Total Project Maximum Daily		40	371	417	7	2,782	287
<i>ICAPCD Thresholds</i>		<i>75</i>	<i>100</i>	<i>550</i>	<i>NA</i>	<i>150</i>	<i>NA</i>
Exceed?		No	Yes	No	No	Yes	NA

Notes:

Arizona Department of Environmental Quality does not have a daily emissions threshold.

Sources: <https://www.epa.gov/general-conformity/de-minimis-tables>; Thresholds used for ozone and PM10 under the Arizona portion reflect that Yuma County, Arizona is currently in nonattainment for ozone and PM10.

Crushing & Blasting Emissions

Crushing & Blasting Assumptions

Equipment	Per Day
Ammonium nitrate/fuel oil (ANFO) [units]	6
Pounds of blasting material	600
Crushing and Processing Equipment [units]	3

Source: Page 15 and 16. Equipment such as Ammonium nitrate/fuel oil (ANFO) would be used as explosives because they are inexpensive and relatively safe. It is assumed that three blasting areas would be active each day, with each area limited to two blasting events and a maximum of 200 pounds of ANFO
<https://files.ceqanet.lci.ca.gov/267127->

Blasting Gaseous Emission Factors (pounds per ton)	
Pollutant	Emission Factors
Carbon Monoxide	67
Nitrogen Oxide	17
Sulfur Oxide	2

Notes: Emission factors for Ammonium nitrate/fuel oil (ANFO). Commonly used as explosives because they are inexpensive and relatively safe
 Source: Drilling & Blasting Operations, Page 2. <https://www.sdapcd.org/content/dam/sdapcd/documents/permits/emissions->

Blasting PM10 and PM2.5 Emissions Factors (pounds per	PM10	PM2.5
Constant	0.000014	0.000014
Exponent	1.5	1.5
A (ft ²)	17,000	17,000
Scaling Factor	0.52	0.03

Notes: A is the area blasted. The geometric mean of 17,000 ft² was used to conservatively estimate emissions
<https://www.epa.gov/sites/default/files/2020-10/documents/c11s09.pdf>

Crushing Emission Factors (g/bhp-hr)										
Equipment	Horsepower	Hours per day	Load Factor	ROG	NOx	CO	SOx	PM10	PM2.5	
Crushing and Processing Equipment	85	8	0.78	0.345	2.248	3.694	0.0006	0.095	0.095	

Source: CalEEMod 2020.4.0. Table 3.4 OFFROAD Equipment Emission Factors.
 Source: USEPA AP-42 11.9. See table 11.9.1 and 11.9.3 https://www.aqmd.gov/docs/default-source/caleemod/user-guide-2021/appendix-d2020-4-0-full-merge.pdf?sfvrsn=e8e1d061_12

Crushing & Blasting Emissions (pounds per day)						
Pollutant	ROG	NOx	CO	SOx	PM10	PM2.5
Max Crushing & Blasting Emissions	1.21	12.98	33.05	0.60	97.15	5.92

Offroad Construction Equipment Combustion Emissions - Maximum Daily

CalEEMod Name	HP	Load Factor	Specific Name	Phase	No. of Equipment per Crew	Hours Per Day	Total No. of Usage Days	No. of Usage Days - 2029	No. of Usage Days - 2030	lbs per day					
										ROG	NOx	CO	SO2	PM10E	PM2.5E
Forklifts (medium)	96	0.2	R/T Forklift	Staging Areas	4	8	100	100	0	0.28	2.65	4.84	0.01	0.09	0.09
Generator Sets	45	0.74	Generator	Staging Areas	1	8	100	100	0	0.16	1.84	2.15	0.00	0.03	0.02
Off-Highway Trucks	350	0.38	Water Truck	Staging Areas	1	8	100	100	0	0.40	1.93	2.72	0.01	0.07	0.06
Graders	200	0.41	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131	0.56	4.51	3.41	0.01	0.16	0.14
Rubber Tired Dozers (medium)	200	0.4	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131	1.24	12.53	9.85	0.01	0.57	0.52
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131	0.81	3.86	5.44	0.02	0.14	0.13
Rollers	150	0.38	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131	0.22	1.51	5.89	0.01	0.07	0.06
Excavators (heavy)	450	0.38	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131	0.33	1.66	3.14	0.02	0.06	0.05
Rubber Tired Dozers (medium)	200	0.4	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131	0.62	6.26	4.92	0.01	0.28	0.26
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131	0.40	1.93	2.72	0.01	0.07	0.06
Rollers	150	0.38	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131	0.11	0.75	2.95	0.01	0.03	0.03
Bore/Drill Rigs	500	0.5	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78	1.28	9.30	13.00	0.07	0.34	0.32
Bore/Drill Rigs	400	0.5	LoDril	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78	1.03	7.44	10.40	0.05	0.28	0.25
Tractors/Loaders/Backhoes	150	0.37	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	8	288	210	78	0.85	4.97	18.32	0.03	0.25	0.23
Cranes (heavy)	425	0.29	CRANE 40T	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	8	288	210	78	2.37	19.30	21.00	0.07	0.81	0.74
Other Material Handling Equipment	400	0.4	Material Handler	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78	1.11	6.15	9.82	0.04	0.21	0.19
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78	0.17	1.09	3.37	0.01	0.05	0.05
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	8	515	253	262	1.21	5.79	8.16	0.04	0.20	0.19
Graders	200	0.41	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262	0.28	2.26	1.71	0.01	0.08	0.07
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262	0.06	0.36	1.12	0.00	0.02	0.02
Off-Highway Trucks	335	0.38	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262	0.39	1.85	2.60	0.01	0.07	0.06
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	4	8	287	183	104	0.23	1.45	4.49	0.01	0.07	0.06
Cranes (heavy)	500	0.29	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	4	8	287	183	104	1.86	15.14	16.47	0.05	0.63	0.58
Excavators (medium)	175	0.38	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting	4	8	287	183	104	0.58	3.42	5.16	0.02	0.12	0.11
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	4	8	287	183	104	0.23	1.45	4.49	0.01	0.07	0.06
Forklifts	100	0.2	FORKLIFT 12K	Structure Installation - Monopole and Lattice - 4-Legged	6	8	287	183	104	0.35	2.18	6.73	0.01	0.10	0.09
Cranes	500	0.29	CRANE 160 TON RT	Structure Installation - Monopole and Lattice - 4-Legged	6	8	287	183	104	2.79	22.71	24.70	0.08	0.95	0.87
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Spotting	1	8	287	183	104	0.06	0.36	1.12	0.00	0.02	0.02
Cranes (medium)	270	0.29	CRANE 100 TON RT	Structure Installation - Spotting	1	8	287	183	104	0.31	2.82	1.95	0.01	0.12	0.11
Rubber Tired Dozers (heavy)	350	0.4	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation	4	8	287	52	235	3.30	28.25	25.98	0.05	1.26	1.17
Rubber Tired Dozers (medium)	200	0.4	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	2	8	287	52	235	1.24	12.53	9.85	0.01	0.57	0.52
Other Construction Equipment	500	0.42	HARDLINE PULLER	Conductor and Wires Installation	4	8	287	52	235	2.15	16.30	18.52	0.07	0.64	0.58
Other Construction Equipment (medium)	175	0.42	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation	6	8	287	52	235	1.45	11.90	10.42	0.04	0.53	0.48
Other Construction Equipment	300	0.42	TENSIONER 72" BNDL TRK MNTD	Conductor and Wires Installation	2	8	287	52	235	0.64	4.89	5.56	0.02	0.19	0.17
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Conductor and Wires Installation	4	8	287	52	235	0.23	1.45	4.49	0.01	0.07	0.06
Off-Highway Trucks	400	0.38	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	4	8	287	52	235	1.84	8.83	12.44	0.05	0.31	0.29
Off-Highway Trucks	300	0.38	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	2	8	287	52	235	0.69	3.31	4.66	0.02	0.12	0.11
Cranes (heavy)	425	0.29	CRANE 40T	Conductor and Wires Installation	11	8	287	52	235	4.35	35.39	38.50	0.12	1.48	1.36
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Conductor and Wires Installation	2	8	287	52	235	0.12	0.73	2.24	0.00	0.03	0.03
Off-Highway Trucks	335	0.38	Mechanic Truck	Conductor and Wires Installation	2	8	287	52	235	0.77	3.70	5.21	0.02	0.13	0.12
Excavators (heavy)	450	0.38	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	8	211	0	211	0.33	1.66	3.14	0.02	0.06	0.05

Offroad Construction Equipment Combustion Emissions - Maximum Daily

Construction Phase	lbs per day					
	ROG	NOx	CO	SO2	PM10E	PM2.5E
Staging Areas	0.85	6.43	9.71	0.02	0.07	0.07
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2.82	22.41	24.59	0.06	0.36	0.33
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1.46	10.60	13.73	0.04	0.17	0.16
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6.82	48.26	75.91	0.26	0.76	0.70
Civil Crew (Road Maintenance, BMP's, Gates)	1.93	10.26	13.60	0.06	0.14	0.13
Structure Installation - Lattice - Guyed V Framing	0.23	1.45	4.49	0.01	0.03	0.02
Structure Installation - Lattice - Guyed V Setting	2.68	20.01	26.12	0.08	0.32	0.30
Structure Installation - Monopole and Lattice - 4-Legged	3.14	24.89	31.43	0.09	0.41	0.38
Structure Installation - Spotting	0.37	3.18	3.07	0.01	0.05	0.05
Conductor and Wires Installation	16.79	127.26	137.86	0.42	2.08	1.91
Civil Crew (Clean Up)	0.33	1.66	3.14	0.02	0.02	0.02

Grading & Material Movement

	Equipment	Lookup	No. of Equipment	Hours Per Day	Acres Graded	lbs per day		
						PM10	PM2.5	
Staging Areas	Forklifts (medium)		4	-	-	-	-	-
Staging Areas	Generator Sets		1	-	-	-	-	-
Staging Areas	Off-Highway Trucks		1	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Graders	Graders	2	-	-	0.50	0.41	0.04
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Rubber Tired Dozers (medium)	Rubber Tired Dozers	2	8	-	0.50	5.11	2.63
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Off-Highway Trucks		2	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Rollers		2	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Excavators (heavy)		1	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Rubber Tired Dozers (medium)	Rubber Tired Dozers	1	8	-	0.50	2.56	1.31
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Off-Highway Trucks		1	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Rollers		1	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bore/Drill Rigs		3	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bore/Drill Rigs		3	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Tractors/Loaders/Backhoes	Crawler Tractors	6	-	-	0.50	1.24	0.13
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Cranes (heavy)		6	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Other Material Handling Equipment		3	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Forklifts (Heavy)		3	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Highway Trucks		3	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Graders	Graders	1	-	-	0.50	0.21	0.02
Civil Crew (Road Maintenance, BMP's, Gates)	Forklifts (Heavy)		1	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Highway Trucks		1	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	Forklifts (Heavy)		4	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Cranes (heavy)		4	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Excavators (medium)		4	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Forklifts (Heavy)		4	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Forklifts		6	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Cranes		6	-	-	-	-	-
Structure Installation - Spotting	Forklifts (Heavy)		1	-	-	-	-	-
Structure Installation - Spotting	Cranes (medium)		1	-	-	-	-	-
Conductor and Wires Installation	Rubber Tired Dozers (heavy)	Rubber Tired Dozers	4	8	-	0.50	10.22	5.25
Conductor and Wires Installation	Rubber Tired Dozers (medium)	Rubber Tired Dozers	2	8	-	0.50	5.11	2.63
Conductor and Wires Installation	Other Construction Equipment		4	-	-	-	-	-
Conductor and Wires Installation	Other Construction Equipment (medium)		6	-	-	-	-	-
Conductor and Wires Installation	Other Construction Equipment		2	-	-	-	-	-
Conductor and Wires Installation	Forklifts (Heavy)		4	-	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		4	-	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		2	-	-	-	-	-
Conductor and Wires Installation	Cranes (heavy)		11	-	-	-	-	-
Conductor and Wires Installation	Forklifts (Heavy)		2	-	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		2	-	-	-	-	-
Civil Crew (Clean Up)	Excavators (heavy)		1	-	-	-	-	-

Grading & Material Movement - Maximum Daily

Construction Phase	lbs per day	
	PM10	PM2.5
Staging Areas	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	5.52	2.67
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	2.56	1.31
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1.24	0.13
Civil Crew (Road Maintenance, BMP's, Gates)	0.21	0.02
Structure Installation - Lattice - Guyed V Framing	-	-
Structure Installation - Lattice - Guyed V Setting	-	-
Structure Installation - Monopole and Lattice - 4-Legged	-	-
Structure Installation - Spotting	-	-
Conductor and Wires Installation	15.33	7.88
Civil Crew (Clean Up)	-	-

Paved Roadway Dust Emission Factors

Paved	PM10 (lb/mile)	PM2.5 (lb/mile)
k	1	0.25
sL	0.1	0.1
W	2.4	2.4
p	2	2
N	365	365
Emission Factor Controlled	0.00030	0.00007
Emission Factor Uncontrolled	0.00066	0.00017

Notes: Used the Controlled emissions factor, which assumes watering twice a day, resulting in a 55% reduction in PM10.
 Source: CalEEMod Appendix C, Section 5.14 (page C-45)

Unpaved Roadway Dust Emission Factors

Unpaved	LHDT2 Diesel 25mph		LDT2 Gas 25 mph		HHDT Diesel 15 mph	
	PM10 (lb/mile)	PM2.5 (lb/mile)	PM10 (lb/mile)	PM2.5 (lb/mile)	PM10 (lb/mile)	PM2.5 (lb/mile)
k	816.47	81.65	816.47	81.65	816.47	81.65
sL	8.50	8.50	8.50	8.50	8.50	8.50
M	0.50	0.50	0.50	0.50	0.50	0.50
p	5	5	5	5	5	5
S	40	40	40	40	40	40
C	0.14	0.05	0.09	0.03	0.09	0.03
Emission Factor Controlled (Calculated)	0.65	0.07	0.65	0.07	0.65	0.07
Emission Factor Uncontrolled (CARB Default)	2	0.2	2	0.2	2	0.2
Emission Factor Uncontrolled (Calculated)	1.45	0.15	1.45	0.15	1.45	0.15

Notes: Used the Controlled emissions factor, which assumes watering twice a day, resulting in a 55% reduction in PM10.
 Source: CalEEMod Appendix C, Section 5.14 (page C-45); https://www.caleemod.com/documents/user-guide/04_Appendix%20C.pdf

$$EF_{unpaved} = \left(\frac{k(s/12)^1 (S/30)^{0.5}}{(M/0.5)^{0.2}} - C \right) \times \left(1 - \frac{P}{365} \right)$$

Roadway Dust Maximum Daily Emission Estimates

Paved Trips Roadway Dust

Unpaved Trips Roadway Dust

Phase	Primary Equipment Description	EMFAC Classification	Fuel Type	Identifier for EF	Trips Per Day	Trip Length (miles)	Paved Trips				Unpaved Trips			
							Daily VMT (miles/day)		lbs per day		Daily VMT (miles/day)		lbs per day	
							PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Staging Areas	1-Ton Truck, 4x4	HHDT	Diesel	HHDT Diesel	8	10	80	0.02	0.01	8	10	80	52.27	5.23
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	Gas	LHDT2 Gas	6	5	28	0.01	0.00	6	5	28	18.11	1.81
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	Gas	LHDT2 Gas	4	5	18	0.01	0.00	4	5	18	12.07	1.21
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	Gas	LHDT2 Gas	24	5	111	0.03	0.01	24	5	111	72.44	7.24
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	Diesel	HHDT Diesel	4	10	40	0.01	0.00	4	10	40	26.13	2.61
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	Diesel	LHDT2 Diesel	4	5	18	0.01	0.00	4	5	18	12.07	1.21
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	Diesel	LHDT2 Diesel	8	10	80	0.02	0.01	8	10	80	52.26	5.22
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	Diesel	LHDT2 Diesel	8	5	37	0.01	0.00	8	5	37	24.15	2.41
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	Gas	LHDT2 Gas	8	5	37	0.01	0.00	8	5	37	24.15	2.41
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	Diesel	LHDT2 Diesel	16	10	160	0.05	0.01	16	10	160	104.53	10.45
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	Gas	LHDT2 Gas	18	5	83	0.02	0.01	18	5	83	54.33	5.43
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	Diesel	HHDT Diesel	6	10	60	0.02	0.00	6	10	60	39.20	3.92
Structure Installation - Spotting	Semi	HHDT	Diesel	HHDT Diesel	6	10	60	0.02	0.00	6	10	60	39.20	3.92
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	Diesel	LHDT2 Diesel	2	5	9	0.00	0.00	2	5	9	6.04	0.60
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	Diesel	LHDT2 Diesel	2	5	9	0.00	0.00	2	5	9	6.04	0.60
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	HHDT Diesel	12	10	120	0.04	0.01	12	10	120	78.40	7.84
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	HHDT Diesel	12	10	120	0.04	0.01	12	10	120	78.40	7.84
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	Diesel	HHDT Diesel	8	10	80	0.02	0.01	8	10	80	52.27	5.23
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	Diesel	LHDT2 Diesel	8	5	37	0.01	0.00	8	5	37	24.15	2.41
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	Gas	LHDT2 Gas	64	5	296	0.09	0.02	64	5	296	193.18	19.31
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	Diesel	LHDT2 Diesel	40	5	185	0.06	0.01	40	5	185	120.73	12.07
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	Gas	LHDT2 Gas	4	5	18	0.01	0.00	4	5	18	12.07	1.21
Staging Areas	Worker	LHDT2	Gas	LHDT2 Gas	12	5	55	0.02	0.00	12	5	55	36.22	3.62
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	Gas	LHDT2 Gas	16	5	74	0.02	0.01	16	5	74	48.30	4.83
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	Gas	LHDT2 Gas	10	5	46	0.01	0.00	10	5	46	30.18	3.02
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	Gas	LHDT2 Gas	42	5	194	0.06	0.01	42	5	194	126.78	12.67
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	Gas	LHDT2 Gas	20	5	92	0.03	0.01	20	5	92	60.37	6.04
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	Gas	LHDT2 Gas	24	5	111	0.03	0.01	24	5	111	72.44	7.24
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	Gas	LHDT2 Gas	40	5	185	0.06	0.01	40	5	185	120.74	12.07
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	Gas	LHDT2 Gas	24	5	111	0.03	0.01	24	5	111	72.44	7.24
Structure Installation - Spotting	Worker	LHDT2	Gas	LHDT2 Gas	32	5	148	0.04	0.01	32	5	148	96.59	9.66
Conductor and Wires Installation	Worker	LHDT2	Gas	LHDT2 Gas	160	5	739	0.22	0.06	160	5	739	482.96	48.28
Civil Crew (Clean Up)	Worker	LHDT2	Gas	LHDT2 Gas	20	5	92	0.03	0.01	20	5	92	60.37	6.04
Staging Areas	Hauling	HHDT	Diesel	HHDT Diesel	2	10	20	0.01	0.00	2	10	20	13.07	1.31
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	Diesel	HHDT Diesel	2	10	20	0.01	0.00	2	10	20	13.07	1.31
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	Diesel	HHDT Diesel	2	10	20	0.01	0.00	2	10	20	13.07	1.31
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	Diesel	HHDT Diesel	2	10	20	0.01	0.00	2	10	20	13.07	1.31
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	Diesel	HHDT Diesel	7	10	73	0.02	0.01	7	10	73	47.95	4.79
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	Diesel	HHDT Diesel	12	10	120	0.04	0.01	12	10	120	78.40	7.84
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	Diesel	HHDT Diesel	12	10	120	0.04	0.01	12	10	120	78.40	7.84
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	Diesel	HHDT Diesel	12	10	120	0.04	0.01	12	10	120	78.40	7.84
Structure Installation - Spotting	Hauling	HHDT	Diesel	HHDT Diesel	12	10	120	0.04	0.01	12	10	120	78.40	7.84
Conductor and Wires Installation	Hauling	HHDT	Diesel	HHDT Diesel	2	10	20	0.01	0.00	2	10	20	13.07	1.31
Civil Crew (Clean Up)	Hauling	HHDT	Diesel	HHDT Diesel	2	10	20	0.01	0.00	2	10	20	13.07	1.31

Note: Emissions assume a 55% reduction in PM10, as watering twice a day for industrial unpaved roads is 55%. Additional measures that will further reduce PM10 include limiting the max speed to 25 mph (44% reduction) and applying chemical dust suppressants annually to unpaved parking areas (84% reduction).

Total Paved Roadway Dust Emissions - Maximum Daily

	lbs per day	
	PM10	PM2.5
Staging Areas	0.05	0.01
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	0.04	0.01
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	0.03	0.01
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	0.11	0.03
Civil Crew (Road Maintenance, BMP's, Gates)	0.05	0.01
Structure Installation - Lattice - Guyed V Framing	0.10	0.03
Structure Installation - Lattice - Guyed V Setting	0.15	0.04
Structure Installation - Monopole and Lattice - 4-Legged	0.11	0.03
Structure Installation - Spotting	0.10	0.03
Conductor and Wires Installation	0.48	0.12
Civil Crew (Clean Up)	0.04	0.01

Total Unpaved Roadway Dust Emissions - Maximum Daily

	lbs per day	
	PM10	PM2.5
Staging Areas	101.56	10.15
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	79.47	7.94
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	55.33	5.53
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	238.42	23.83
Civil Crew (Road Maintenance, BMP's, Gates)	120.40	12.04
Structure Installation - Lattice - Guyed V Framing	227.26	22.72
Structure Installation - Lattice - Guyed V Setting	327.82	32.77
Structure Installation - Monopole and Lattice - 4-Legged	244.38	24.43
Structure Installation - Spotting	226.27	22.62
Conductor and Wires Installation	1,043.15	104.28
Civil Crew (Clean Up)	85.51	8.55

Mobile Combustion Maximum Daily Emissions - Paved Roadways

Phase	Primary Equipment Description	EMFAC Classification	Fuel Type	Speed Bin (mph)	EMFAC Emission Factors (g/mile)										Daily Emissions (lb/day)															
					Trips Per Day	Paved Trip Length (miles)	Total Trip Length (mi)	Daily VMT (miles/day)	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM10_P MTW	PM10_PMB W	PM2.5 Exhaust	PM2.5_P MTW	PM2.5_P MBW	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM10_P MTW	PM10_PMB W	PM2.5 Exhaust	PM2.5_P MTW	PM2.5_PMB W	PM2.5 TOTAL	
																														PM10
Staging Areas	1-Ton Truck, 4x4	HHDT	Diesel	Aggregate	8	10	20	80	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.01	0.10	0.02	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	Gas	Aggregate	6	5	9	28	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.01	0.10	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	Gas	Aggregate	4	5	9	18	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.01	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	Gas	Aggregate	24	5	9	111	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.03	0.41	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	Diesel	Aggregate	4	10	20	40	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.05	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	Diesel	Aggregate	4	5	9	18	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	Diesel	Aggregate	8	10	20	80	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.01	0.10	0.02	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	Diesel	Aggregate	8	5	9	37	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.01	0.14	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	Gas	Aggregate	8	5	9	37	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.01	0.14	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	Diesel	Aggregate	16	10	20	160	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.02	0.19	0.04	0.00	0.00	0.00	0.03	0.04	0.00	0.00	0.01	0.02
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	Gas	Aggregate	18	5	9	83	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.03	0.31	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	Diesel	Aggregate	6	10	20	60	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.01	0.07	0.02	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.01
Structure Installation - Spotting	Semi	HHDT	Diesel	Aggregate	6	10	20	60	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.01	0.07	0.02	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.01
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	Diesel	Aggregate	2	5	9	9	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	Diesel	Aggregate	2	5	9	9	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	Aggregate	12	10	20	120	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.01	0.15	0.03	0.00	0.00	0.00	0.02	0.03	0.00	0.00	0.01	0.01
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	Aggregate	12	10	20	120	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.01	0.15	0.03	0.00	0.00	0.00	0.02	0.03	0.00	0.00	0.01	0.01
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	Diesel	Aggregate	8	10	20	80	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.01	0.10	0.02	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	Diesel	Aggregate	8	5	9	37	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.04	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	Gas	Aggregate	64	5	9	296	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.01	0.09	1.09	0.00	0.00	0.01	0.06	0.07	0.00	0.00	0.02	0.02
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	Diesel	Aggregate	40	5	9	185	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.02	0.22	0.05	0.00	0.01	0.00	0.04	0.05	0.01	0.00	0.01	0.02
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	Gas	Aggregate	4	5	9	18	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.01	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staging Areas	Worker	LHDT2	Gas	Aggregate	12	5	9	55	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.02	0.20	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	Gas	Aggregate	16	5	9	74	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.02	0.27	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.01	0.01
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	Gas	Aggregate	10	5	9	46	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.01	0.17	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	Gas	Aggregate	42	5	9	194	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.01	0.06	0.72	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.01	0.01
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	Gas	Aggregate	20	5	9	92	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.03	0.34	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	Gas	Aggregate	24	5	9	111	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.03	0.41	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	Gas	Aggregate	40	5	9	185	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.01	0.06	0.68	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.01	0.01
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	Gas	Aggregate	24	5	9	111	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.03	0.41	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01
Structure Installation - Spotting	Worker	LHDT2	Gas	Aggregate	32	5	9	148	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.04	0.55	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.01	0.01
Conductor and Wires Installation	Worker	LHDT2	Gas	Aggregate	160	5	9	739	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.02	0.22	2.73	0.00	0.00	0.01	0.15	0.16	0.00	0.00	0.05	0.06
Civil Crew (Clean Up)	Worker	LHDT2	Gas	Aggregate	20	5	9	92	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.03	0.34	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01
Staging Areas	Hauling	HHDT	Diesel	Aggregate	2	10	20	20	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	Diesel	Aggregate	2	10	20	20	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	Diesel	Aggregate	2	10	20	20	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	Diesel	Aggregate	2	10	20	20	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	Diesel	Aggregate	7	10	20	73	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.01	0.09	0.02	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.01	0.01
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	Diesel	Aggregate																										

Mobile Combustion Maximum Daily Emissions - Unpaved Roadways

Phase	Primary Equipment Description	EMFAC Classification	Work Days					EMFAC Emission Factors (g/mile)														Daily Emissions (lb/day)													
			2029	2030	Fuel Type	Speed Bin	Trips Per Day	Trip Length (miles)	Daily VMT (miles/day)	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM10_PMT W	PM10_PMBW	PM2.5 Exhaust	PM2.5_PM TW	PM2.5_P MBW	CO2	NH4	N2O	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM10_P MTW	PM10_PMB W	PM10_PMB TOTAL	PM2.5 Exhaust	PM2.5_P MTW	PM2.5_PMB BW	PM2.5 TOTAL	
Staging Areas	1-Ton Truck, 4x4	HHDT	100	-	Diesel	15	8	10	80	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	1,892.88	0.00	0.40	0.01	0.28	0.06	0.00	0.00	-	0.02	0.03	0.00	-	0.01	0.01	
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	235	131	Gas	25	6	5	28	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.00	0.01	0.08	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	235	131	Gas	25	4	5	18	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.00	0.01	0.05	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	210	78	Gas	25	24	5	111	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.01	0.01	0.03	0.32	0.00	0.00	-	0.02	0.02	0.00	-	0.01	0.01
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	210	78	Diesel	15	4	10	40	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	1,892.88	0.00	0.40	0.00	0.14	0.03	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00	
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	253	262	Diesel	25	4	5	18	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	735.52	0.01	0.38	0.01	0.02	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	183	104	Diesel	25	8	10	80	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	735.52	0.01	0.38	0.02	0.11	0.05	0.00	0.00	-	0.02	0.02	0.00	-	0.01	0.01	
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	183	104	Diesel	25	8	5	37	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.00	0.01	0.11	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00	
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	183	104	Gas	25	8	5	37	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.00	0.01	0.11	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00	
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	183	104	Diesel	25	16	10	160	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	735.52	0.01	0.38	0.04	0.21	0.11	0.00	0.01	-	0.03	0.04	0.01	-	0.01	0.02	
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	183	104	Gas	25	18	5	83	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.00	0.02	0.24	0.00	0.00	-	0.02	0.02	0.00	-	0.01	0.01	
Structure Installation - Monopole and Lattice - 4-Legged	HHDT	LHDT2	183	104	Diesel	15	6	10	60	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	735.52	0.01	0.38	0.02	0.08	0.04	0.00	0.00	-	0.01	0.02	0.00	-	0.00	0.01	
Structure Installation - Spotting	Semi	HHDT	183	104	Diesel	15	6	10	60	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	735.52	0.01	0.38	0.02	0.08	0.04	0.00	0.00	-	0.01	0.02	0.00	-	0.00	0.01	
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	183	104	Diesel	25	2	5	9	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	735.52	0.01	0.38	0.00	0.01	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	183	104	Diesel	25	2	5	9	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	735.52	0.01	0.38	0.00	0.01	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	15	12	10	120	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	1,892.88	0.00	0.40	0.01	0.42	0.09	0.00	0.00	-	0.04	0.04	0.00	-	0.01	0.01	
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	15	12	10	120	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	1,892.88	0.00	0.40	0.01	0.42	0.09	0.00	0.00	-	0.04	0.04	0.00	-	0.01	0.01	
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	52	235	Diesel	15	8	10	80	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	1,892.88	0.00	0.40	0.01	0.28	0.06	0.00	0.00	-	0.02	0.03	0.00	-	0.01	0.01	
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	52	235	Diesel	25	8	5	37	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	735.52	0.01	0.38	0.01	0.05	0.02	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00	
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	52	235	Gas	25	64	5	296	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.02	0.08	0.84	0.00	0.00	-	0.06	0.06	0.00	-	0.02	0.02	
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	52	235	Diesel	25	40	5	185	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	735.52	0.01	0.38	0.05	0.24	0.12	0.00	0.01	-	0.04	0.05	0.01	-	0.01	0.02	
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	-	211	Gas	25	4	5	18	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.00	0.01	0.05	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	
Staging Areas	Worker	LHDT2	100	-	Gas	25	12	5	55	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.00	0.02	0.16	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	235	131	Gas	25	16	5	74	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.00	0.02	0.21	0.00	0.00	-	0.01	0.01	0.00	-	0.01	0.01	
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	235	131	Gas	25	10	5	46	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.00	0.01	0.13	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	210	78	Gas	25	42	5	194	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.01	0.05	0.55	0.00	0.00	-	0.04	0.04	0.00	-	0.01	0.01	
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	253	262	Gas	25	20	5	92	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.00	0.03	0.26	0.00	0.00	-	0.02	0.02	0.00	-	0.01	0.01	
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	183	104	Gas	25	24	5	111	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.01	0.03	0.32	0.00	0.00	-	0.02	0.02	0.00	-	0.01	0.01	
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	183	104	Gas	25	40	5	185	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.01	0.05	0.53	0.00	0.00	-	0.04	0.04	0.00	-	0.01	0.01	
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	183	104	Gas	25	24	5	111	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.01	0.03	0.32	0.00	0.00	-	0.02	0.02	0.00	-	0.01	0.01	
Structure Installation - Spotting	Worker	LHDT2	183	104	Gas	25	32	5	148	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.01	0.04	0.42	0.00	0.00	-	0.03	0.03	0.00	-	0.01	0.01	
Conductor and Wires Installation	Worker	LHDT2	52	235	Gas	25	160	5	739	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.04	0.21	2.11	0.01	0.00	-	0.15	0.15	0.00	-	0.05	0.05	
Civil Crew (Clean Up)	Worker	LHDT2	-	211	Gas	25	20	5	92	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	858.53	0.01	0.01	0.00	0.03	0.26	0.00	0.00	-	0.02	0.02	0.00	-	0.01	0.01	
Staging Areas	Hauling	HHDT	100	-	Diesel	15	2	10	20	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	1,892.88	0.00	0.40	0.00	0.07	0.01	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	235	131	Diesel	15	2	10	20	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	1,892.88	0.00	0.40	0.00	0.07	0.01	0.00	0.00	-</							

Helicopter Emissions - Maximum Daily

Phase	Type	lbs per day					
		ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Staging Areas	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Staging Areas	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	0.78	62.94	12.12	3.90	4.32	-
Structure Installation - Lattice - Guyed V Framing	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Structure Installation - Spotting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Structure Installation - Spotting	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Conductor and Wires Installation	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Conductor and Wires Installation	Bell 407/MD530F (Light Duty)	1.30	17.50	20.70	1.40	1.00	-
Civil Crew (Clean Up)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Civil Crew (Clean Up)	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-

Localized Daily Air Quality Calculations

Summary of Project Construction Maximum Daily Emissions

Construction Phase	Source	lbs per day				
		ROG	NOx	CO	SO2	PM10
Staging Areas	Off-Road Equipment	0.85	6.43	9.71	0.02	0.07
Staging Areas	Dust from Material Movement	-	-	-	-	-
Staging Areas	On-Road Trip Exhaust (Paved)	0.00	0.00	0.01	0.00	0.00
Staging Areas	On-Road Trip Exhaust (Unpaved)	0.00	0.01	0.01	0.00	0.00
Staging Areas	On-Road Roadway Dust (Paved)	-	-	-	-	0.00
Staging Areas	On-Road Roadway Dust (Unpaved)	-	-	-	-	2.03
Staging Areas	Helicopter Use	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Off-Road Equipment	1.41	11.20	12.30		0.18
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Dust from Material Movement	-	-	-		2.76
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Trip Exhaust (Paved)	0.00	0.00	0.02		0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Trip Exhaust (Unpaved)	0.00	0.00	0.01	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	1.94
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Helicopter Use	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Off-Road Equipment	1.46	10.60	13.73	0.04	0.17
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Dust from Material Movement	-	-	-	-	2.56
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Trip Exhaust (Paved)	0.00	0.00	0.01	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Trip Exhaust (Unpaved)	0.00	0.00	0.01	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	1.48
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Helicopter Use	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Off-Road Equipment	2.27	16.09	25.30	0.09	0.25
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Dust from Material Movement	-	-	-	-	0.41
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Trip Exhaust (Paved)	0.00	0.00	0.05	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Trip Exhaust (Unpaved)	0.00	0.01	0.04	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	4.92
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Helicopter Use	-	-	-	-	-

Ironwood Transmission Construction
 Air Quality Emissions - Maximum Daily

Construction Phase	Source	lbs per day				
		ROG	NOx	CO	SO2	PM10
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Road Equipment	1.93	10.26	13.60	0.06	0.14
Civil Crew (Road Maintenance, BMP's, Gates)	Dust from Material Movement	-	-	-	-	0.21
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Trip Exhaust (Paved)	0.00	0.00	0.02	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Trip Exhaust (Unpaved)	0.00	0.01	0.02	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Roadway Dust (Paved)	-	-	-	-	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Roadway Dust (Unpaved)	-	-	-	-	2.89
Civil Crew (Road Maintenance, BMP's, Gates)	Helicopter Use	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	Off-Road Equipment	0.06	0.36	1.12	0.00	0.01
Structure Installation - Lattice - Guyed V Framing	Dust from Material Movement	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	On-Road Trip Exhaust (Paved)	0.00	0.01	0.02	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	On-Road Trip Exhaust (Unpaved)	0.00	0.01	0.02	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	On-Road Roadway Dust (Paved)	-	-	-	-	0.00
Structure Installation - Lattice - Guyed V Framing	On-Road Roadway Dust (Unpaved)	-	-	-	-	3.69
Structure Installation - Lattice - Guyed V Framing	Helicopter Use	0.78	62.94	12.12	3.90	4.32
Structure Installation - Lattice - Guyed V Setting	Off-Road Equipment	0.67	5.00	6.53	0.02	0.08
Structure Installation - Lattice - Guyed V Setting	Dust from Material Movement	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	On-Road Trip Exhaust (Paved)	0.00	0.01	0.04	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	On-Road Trip Exhaust (Unpaved)	0.00	0.01	0.03	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	On-Road Roadway Dust (Paved)	-	-	-	-	0.00
Structure Installation - Lattice - Guyed V Setting	On-Road Roadway Dust (Unpaved)	-	-	-	-	5.35
Structure Installation - Lattice - Guyed V Setting	Helicopter Use	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Off-Road Equipment	0.65	5.14	6.41	0.02	0.08
Structure Installation - Monopole and Lattice - 4-Legged	Dust from Material Movement	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Trip Exhaust (Paved)	0.00	0.01	0.03	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Trip Exhaust (Unpaved)	0.00	0.01	0.02	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Roadway Dust (Paved)	-	-	-	-	0.00
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Roadway Dust (Unpaved)	-	-	-	-	4.06
Structure Installation - Monopole and Lattice - 4-Legged	Helicopter Use	-	-	-	-	-

Ironwood Transmission Construction
 Air Quality Emissions - Maximum Daily

Construction Phase	Source	lbs per day				
		ROG	NO _x	CO	SO ₂	PM ₁₀
Structure Installation - Spotting	Off-Road Equipment	0.37	3.18	3.07	0.01	0.05
Structure Installation - Spotting	Dust from Material Movement	-	-	-	-	-
Structure Installation - Spotting	On-Road Trip Exhaust (Paved)	0.00	0.01	0.01	0.00	0.00
Structure Installation - Spotting	On-Road Trip Exhaust (Unpaved)	0.00	0.01	0.01	0.00	0.00
Structure Installation - Spotting	On-Road Roadway Dust (Paved)	-	-	-	-	0.00
Structure Installation - Spotting	On-Road Roadway Dust (Unpaved)	-	-	-	-	2.58
Structure Installation - Spotting	Helicopter Use	-	-	-	-	-
Conductor and Wires Installation	Off-Road Equipment	8.40	63.63	68.93	0.21	1.04
Conductor and Wires Installation	Dust from Material Movement	-	-	-	-	7.67
Conductor and Wires Installation	On-Road Trip Exhaust (Paved)	0.00	0.02	0.06	0.00	0.01
Conductor and Wires Installation	On-Road Trip Exhaust (Unpaved)	0.00	0.03	0.05	0.00	0.00
Conductor and Wires Installation	On-Road Roadway Dust (Paved)	-	-	-	-	0.01
Conductor and Wires Installation	On-Road Roadway Dust (Unpaved)	-	-	-	-	9.78
Conductor and Wires Installation	Helicopter Use	1.30	17.50	20.70	1.40	1.00
Civil Crew (Clean Up)	Off-Road Equipment	0.33	1.66	3.14	0.02	0.02
Civil Crew (Clean Up)	Dust from Material Movement	-	-	-	-	-
Civil Crew (Clean Up)	On-Road Trip Exhaust (Paved)	0.00	0.00	0.02	0.00	0.00
Civil Crew (Clean Up)	On-Road Trip Exhaust (Unpaved)	0.00	0.00	0.02	0.00	0.00
Civil Crew (Clean Up)	On-Road Roadway Dust (Paved)	-	-	-	-	0.00
Civil Crew (Clean Up)	On-Road Roadway Dust (Unpaved)	-	-	-	-	2.40
Civil Crew (Clean Up)	Helicopter Use	-	-	-	-	-

Ironwood Transmission Construction
 Air Quality Emissions - Maximum Daily

Construction Phase	Source	ROG	NO _x	lbs per day		
				CO	SO ₂	PM ₁₀
Maximum Daily Emissions						
Construction Phase	Source	ROG	NO _x	CO	SO ₂	PM ₁₀
Staging Areas	Total	1	6	10	0	2
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Total	1	11	12	0	5
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Total	1	11	14	0	4
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Total	2	16	25	0	6
Civil Crew (Road Maintenance, BMP's, Gates)	Total	2	10	14	0	3
Structure Installation - Lattice - Guyed V Framing	Total	1	63	13	4	8
Structure Installation - Lattice - Guyed V Setting	Total	1	5	7	0	5
Structure Installation - Monopole and Lattice - 4-Legged	Total	1	5	6	0	4
Structure Installation - Spotting	Total	0	3	3	0	3
Conductor and Wires Installation	Total	10	81	90	2	19
Civil Crew (Clean Up)	Total	0	2	3	0	2
Maximum Daily Overlapping Phases		3	70	35	4	10
Total Project Maximum Daily		10	81	90	4	19
<i>ICAPCD Thresholds</i>		<i>75</i>	<i>100</i>	<i>550</i>	<i>NA</i>	<i>150</i>
Exceed?		No	No	No	NA	No

Notes:

Arizona Department of Environmental Quality does not have a daily emissions threshold.

Sources: <https://www.epa.gov/general-conformity/de-minimis-tables>; Thresholds used for ozone and PM10 under the Arizona portion reflect that Yuma County, Arizona is currently in nonattainment for and PM10.

Daily Acres Graded by Equipment Type

Equipment	Acres Graded per 8 Hours
Crawler Tractors	0.5
Graders	0.5
Rubber Tired Dozers	0.5
Scrapers	1

Source: CalEEMod Appendix G, Table G-14

Grading Emission Factor (lbs/acre/day)		
Pollutant	PM10	PM2.5
S	7.10	7.10
F	0.60	0.03
Wb	12	12
SF per acre	43,560	43,560
Ft per mile	5,280	5,280
Uncontrolled EF	1.06	0.11
Controlled EF	0.41	0.04

Notes: Grading calculations rely upon this equation (acres graded per day x EF) for Loaders & Scrapers; controlled EF assumes 61% reduction in PM from 2x per day watering.
 Source: CalEEMod Appendix C, Section 4.4.1 (pg C-11)

Bulldozing Emission Factor (lbs/hr)		
Pollutant	PM10	PM2.5
C	1.00	5.70
s	6.90	6.90
M	7.90	7.90
F	0.75	0.11
Uncontrolled EF	0.75	0.41
Controlled EF	0.29	0.16

Notes: Bulldozer calculations rely upon this equation (hours per day x emission factor (EF)) for Dozers; controlled EF assumes 61% reduction in PM from 2x per day watering.
 Source: CalEEMod Appendix C, Section 4.4.2 (pg C-12)

Offroad Construction Equipment Combustion Emissions - Maximum Daily

CalEEMod Name	HP	Load Factor	Specific Name	Phase	No. of Equipment per Crew	Hours Per Day	Total No. of Usage Days	lbs per day					
								ROG	NOx	CO	SO2	PM10E	PM2.5E
Forklifts (medium)	96	0.2	R/T Forklift	Staging Areas	4	8	100	0.28	2.65	4.84	0.01	0.09	0.09
Generator Sets	45	0.74	Generator	Staging Areas	1	8	100	0.16	1.84	2.15	0.00	0.03	0.02
Off-Highway Trucks	350	0.38	Water Truck	Staging Areas	1	8	100	0.40	1.93	2.72	0.01	0.07	0.06
Graders	200	0.41	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	8	366	0.28	2.26	1.71	0.01	0.08	0.07
Rubber Tired Dozers (medium)	200	0.4	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	8	366	0.62	6.26	4.92	0.01	0.28	0.26
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	8	366	0.40	1.93	2.72	0.01	0.07	0.06
Rollers	150	0.38	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	8	366	0.11	0.75	2.95	0.01	0.03	0.03
Excavators (heavy)	450	0.38	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	0.33	1.66	3.14	0.02	0.06	0.05
Rubber Tired Dozers (medium)	200	0.4	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	0.62	6.26	4.92	0.01	0.28	0.26
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	0.40	1.93	2.72	0.01	0.07	0.06
Rollers	150	0.38	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	0.11	0.75	2.95	0.01	0.03	0.03
Bore/Drill Rigs	500	0.5	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	8	288	0.43	3.10	4.33	0.02	0.11	0.11
Bore/Drill Rigs	400	0.5	LoDrill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	8	288	0.34	2.48	3.47	0.02	0.09	0.08
Tractors/Loaders/Backhoes	150	0.37	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2	8	288	0.28	1.66	6.11	0.01	0.08	0.08
Cranes (heavy)	425	0.29	CRANE 40T	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2	8	288	0.79	6.43	7.00	0.02	0.27	0.25
Other Material Handling Equipment	400	0.4	Material Handler	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	8	288	0.37	2.05	3.27	0.01	0.07	0.06
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	8	288	0.06	0.36	1.12	0.00	0.02	0.02
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	8	515	1.21	5.79	8.16	0.04	0.20	0.19
Graders	200	0.41	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	0.28	2.26	1.71	0.01	0.08	0.07
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	0.06	0.36	1.12	0.00	0.02	0.02
Off-Highway Trucks	335	0.38	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	0.39	1.85	2.60	0.01	0.07	0.06
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	1	8	287	0.06	0.36	1.12	0.00	0.02	0.02
Cranes (heavy)	500	0.29	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	1	8	287	0.47	3.78	4.12	0.01	0.16	0.15
Excavators (medium)	175	0.38	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting	1	8	287	0.15	0.86	1.29	0.01	0.03	0.03
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	1	8	287	0.06	0.36	1.12	0.00	0.02	0.02
Forklifts	100	0.2	FORKLIFT 12K	Structure Installation - Monopole and Lattice - 4-Legged	1	9	287	0.07	0.41	1.26	0.00	0.02	0.02
Cranes	500	0.29	CRANE 160 TON RT	Structure Installation - Monopole and Lattice - 4-Legged	1	10	287	0.58	4.73	5.15	0.02	0.20	0.18
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Spotting	1	8	287	0.06	0.36	1.12	0.00	0.02	0.02
Cranes (medium)	270	0.29	CRANE 100 TON RT	Structure Installation - Spotting	1	8	287	0.31	2.82	1.95	0.01	0.12	0.11
Rubber Tired Dozers (heavy)	350	0.4	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation	2	8	287	1.65	14.12	12.99	0.02	0.63	0.58
Rubber Tired Dozers (medium)	200	0.4	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	1	8	287	0.62	6.26	4.92	0.01	0.28	0.26
Other Construction Equipment	500	0.42	HARDLINE PULLER	Conductor and Wires Installation	2	8	287	1.07	8.15	9.26	0.04	0.32	0.29
Other Construction Equipment (medium)	175	0.42	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation	3	8	287	0.72	5.95	5.21	0.02	0.26	0.24
Other Construction Equipment	300	0.42	TENSIONER 72" BNDL TRK MNTD	Conductor and Wires Installation	1	8	287	0.32	2.44	2.78	0.01	0.10	0.09
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Conductor and Wires Installation	2	8	287	0.12	0.73	2.24	0.00	0.03	0.03
Off-Highway Trucks	400	0.38	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	2	8	287	0.92	4.41	6.22	0.03	0.16	0.14
Off-Highway Trucks	300	0.38	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	1	8	287	0.35	1.65	2.33	0.01	0.06	0.05
Cranes (heavy)	425	0.29	CRANE 40T	Conductor and Wires Installation	6	8	287	2.18	17.69	19.25	0.06	0.74	0.68
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Conductor and Wires Installation	1	8	287	0.06	0.36	1.12	0.00	0.02	0.02
Off-Highway Trucks	335	0.38	Mechanic Truck	Conductor and Wires Installation	1	8	287	0.39	1.85	2.60	0.01	0.07	0.06
Excavators (heavy)	450	0.38	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	8	211	0.33	1.66	3.14	0.02	0.06	0.05

lbs per day						
ROG	NOx	CO	SO2	PM10E	PM2.5E	
0.85	6.43	9.71	0.02	0.07	0.07	
1.41	11.20	12.30	0.03	0.18	0.17	
1.46	10.60	13.73	0.04	0.17	0.16	
2.27	16.09	25.30	0.09	0.25	0.23	
1.93	10.26	13.60	0.06	0.14	0.13	
0.06	0.36	1.12	0.00	0.01	0.01	
0.67	5.00	6.53	0.02	0.08	0.07	
0.65	5.14	6.41	0.02	0.08	0.08	
0.37	3.18	3.07	0.01	0.05	0.05	
8.40	63.63	68.93	0.21	1.04	0.95	
0.33	1.66	3.14	0.02	0.02	0.02	

Grading & Material Movement

	Equipment	Lookup	No. of Equipment	Hours Per Day	Acres Graded	lbs per day	
						PM10	PM2.5
Staging Areas	Forklifts (medium)		4	-	-	-	-
Staging Areas	Generator Sets		1	-	-	-	-
Staging Areas	Off-Highway Trucks		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Graders	Graders	1	-	0.50	0.21	0.02
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Rubber Tired Dozers (medium)	Rubber Tired Dozers	1	8	0.50	2.56	1.31
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Off-Highway Trucks		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Rollers		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Excavators (heavy)		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Rubber Tired Dozers (medium)	Rubber Tired Dozers	1	8	0.50	2.56	1.31
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Off-Highway Trucks		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Rollers		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bore/Drill Rigs		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bore/Drill Rigs		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Tractors/Loaders/Backhoes	Crawler Tractors	2	-	0.50	0.41	0.04
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Cranes (heavy)		2	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Other Material Handling Equipment		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Forklifts (Heavy)		1	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Highway Trucks		3	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Graders	Graders	1	-	0.50	0.21	0.02
Civil Crew (Road Maintenance, BMP's, Gates)	Forklifts (Heavy)		1	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Highway Trucks		1	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	Forklifts (Heavy)		1	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Cranes (heavy)		1	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Excavators (medium)		1	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Forklifts (Heavy)		1	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Forklifts		1	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Cranes		1	-	-	-	-
Structure Installation - Spotting	Forklifts (Heavy)		1	-	-	-	-
Structure Installation - Spotting	Cranes (medium)		1	-	-	-	-
Conductor and Wires Installation	Rubber Tired Dozers (heavy)	Rubber Tired Dozers	2	8	0.50	5.11	2.63
Conductor and Wires Installation	Rubber Tired Dozers (medium)	Rubber Tired Dozers	1	8	0.50	2.56	1.31
Conductor and Wires Installation	Other Construction Equipment		2	-	-	-	-
Conductor and Wires Installation	Other Construction Equipment (medium)		3	-	-	-	-
Conductor and Wires Installation	Other Construction Equipment		1	-	-	-	-
Conductor and Wires Installation	Forklifts (Heavy)		2	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		2	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		1	-	-	-	-
Conductor and Wires Installation	Cranes (heavy)		6	-	-	-	-
Conductor and Wires Installation	Forklifts (Heavy)		1	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		1	-	-	-	-
Civil Crew (Clean Up)	Excavators (heavy)		1	-	-	-	-

Grading & Material Movement - Maximum Daily

Construction Phase	lbs per day	
	PM10	PM2.5
Staging Areas	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2.76	1.34
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	2.56	1.31
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	0.41	0.04
Civil Crew (Road Maintenance, BMP's, Gates)	0.21	0.02
Structure Installation - Lattice - Guyed V Framing	-	-
Structure Installation - Lattice - Guyed V Setting	-	-
Structure Installation - Monopole and Lattice - 4-Legged	-	-
Structure Installation - Spotting	-	-
Conductor and Wires Installation	7.67	3.94
Civil Crew (Clean Up)	-	-

Paved Roadway Dust Emission Factors

Paved	PM10 (lb/mile)	PM2.5 (lb/mile)
k	1	0.25
sl	0.1	0.1
W	2.4	0.4
P	2	2
N	365	365
Emission Factor Controlled	0.00030	0.00007
Emission Factor Uncontrolled	0.00066	0.00017

Notes: Used the Controlled emissions factor, which assumes watering twice a day, resulting in a 55% reduction in PM10. Additional measures that will further reduce PM10 include limiting the max speed to 25 mph (44% reduction), which was also applied.
 Source: CalEEMod Appendix C, Section 5.14 (page C-45)

Unpaved Roadway Dust Emission Factors

Unpaved	Dummy cells for emissions calculations:					
	LHD72 Diesel 35mph		LHD72 Gas 25 mph		HHDT Diesel 15 mph	
	PM10 (lb/mile)	PM2.5 (lb/mile)	PM10 (lb/mile)	PM2.5 (lb/mile)	PM10 (lb/mile)	PM2.5 (lb/mile)
k	816.47	81.65	816.47	81.65	816.47	81.65
sl	8.50	8.50	8.50	8.50	8.50	8.50
W	0.50	0.50	0.50	0.50	0.50	0.50
P	2	2	2	2	2	2
S	40	40	40	40	40	40
C	0.14	0.05	0.09	0.03	0.09	0.03
Emission Factor Controlled (Calculated)	0.37	0.04	0.37	0.04	0.37	0.04
Emission Factor Uncontrolled (GARH Default)	2	0.2	2	0.2	2	0.2
Emission Factor Uncontrolled (Calculated)	1.46	0.15	1.46	0.15	1.46	0.15

Notes: Used the Controlled emissions factor, which assumes watering twice a day, resulting in a 55% reduction in PM10. Additional measures that will further reduce PM10 include limiting the max speed to 25 mph (44% reduction), which was also applied.
 Source: CalEEMod Appendix C, Section 5.14 (page C-45); https://www.calecomod.com/documents/userguide/04_Appendix%20C.pdf

$$EF_{unpaved} = \left(\frac{k(s/12)^1 (S/30)^{0.5}}{(M/0.5)^{0.2}} - C \right) \times \left(1 - \frac{P}{36} \right)$$

Roadway Dust Maximum Daily Emission Estimates

Phase	Primary Equipment Description	EMFAC Classification	Fuel Type	Identifier for EF	Paved Trips		Unpaved Trips		lbs per day		
					Trips Per Day	Trip Length (miles)	Daily VMT (miles/da)	Trip Length (miles)	Daily VMT (miles/da)	PM10	PM2.5
Staging Areas	1-Ton Truck, 4x4	HHDT Diesel	Diesel	HHDT Diesel	8	0.25	2	0.25	2	0.74	0.07
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHD72 Gas	Gas	LHD72 Gas	3	0.25	1	0.25	1	0.28	0.03
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHD72 Gas	Gas	LHD72 Gas	4	0.25	1	0.25	1	0.37	0.04
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHD72 Gas	Gas	LHD72 Gas	8	0.25	2	0.25	2	0.74	0.07
Civil Crew (Road Maintenance, BMP's, Gates)	Semi	HHDT Diesel	Diesel	HHDT Diesel	1	0.25	0	0.25	0	0.12	0.01
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHD72 Diesel	Diesel	LHD72 Diesel	4	0.25	1	0.25	1	0.37	0.04
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHD72 Diesel	Diesel	LHD72 Diesel	2	0.25	1	0.25	1	0.18	0.02
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	LHD72 Diesel	Diesel	LHD72 Diesel	2	0.25	1	0.25	1	0.18	0.02
Structure Installation - Spotting	PICKUP 3/4 TON	LHD72 Gas	Gas	LHD72 Gas	2	0.25	1	0.25	1	0.18	0.02
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHD72 Diesel	Diesel	LHD72 Diesel	4	0.25	1	0.25	1	0.37	0.04
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHD72 Gas	Gas	LHD72 Gas	6	0.25	2	0.25	2	0.55	0.06
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT Diesel	Diesel	HHDT Diesel	2	0.25	1	0.25	1	0.18	0.02
Structure Installation - Spotting	Semi	HHDT Diesel	Diesel	HHDT Diesel	2	0.25	1	0.25	1	0.18	0.02
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHD72 Diesel	Diesel	LHD72 Diesel	2	0.25	1	0.25	1	0.18	0.02
Structure Installation - Spotting	PICKUP 3/4 TON	LHD72 Diesel	Diesel	LHD72 Diesel	2	0.25	1	0.25	1	0.18	0.02
Conductor and Wires Installation	SEMI - ON ROAD	HHDT Diesel	Diesel	HHDT Diesel	6	0.25	2	0.25	2	0.55	0.06
Conductor and Wires Installation	SEMI - ON ROAD	HHDT Diesel	Diesel	HHDT Diesel	6	0.25	2	0.25	2	0.55	0.06
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT Diesel	Diesel	HHDT Diesel	4	0.25	1	0.25	1	0.37	0.04
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHD72 Diesel	Diesel	LHD72 Diesel	4	0.25	1	0.25	1	0.37	0.04
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHD72 Gas	Gas	LHD72 Gas	32	0.25	8	0.25	8	2.95	0.30
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHD72 Diesel	Diesel	LHD72 Diesel	20	0.25	5	0.25	5	1.84	0.18
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHD72 Gas	Gas	LHD72 Gas	4	0.25	1	0.25	1	0.37	0.04
Staging Areas	Worker	LHD72 Gas	Gas	LHD72 Gas	12	0.25	3	0.25	3	1.11	0.11
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHD72 Gas	Gas	LHD72 Gas	16	0.25	4	0.25	4	1.48	0.15
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHD72 Gas	Gas	LHD72 Gas	10	0.25	3	0.25	3	0.92	0.09
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHD72 Gas	Gas	LHD72 Gas	42	0.25	11	0.25	11	3.87	0.39
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHD72 Gas	Gas	LHD72 Gas	20	0.25	5	0.25	5	1.84	0.18
Structure Installation - Lattice - Guyed V Framing	Worker	LHD72 Gas	Gas	LHD72 Gas	24	0.25	6	0.25	6	2.21	0.22
Structure Installation - Lattice - Guyed V Setting	Worker	LHD72 Gas	Gas	LHD72 Gas	40	0.25	10	0.25	10	3.69	0.37
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHD72 Gas	Gas	LHD72 Gas	24	0.25	6	0.25	6	2.21	0.22
Structure Installation - Spotting	Worker	LHD72 Gas	Gas	LHD72 Gas	10	0.25	3	0.25	3	0.92	0.09
Conductor and Wires Installation	Worker	LHD72 Gas	Gas	LHD72 Gas	32	0.25	8	0.25	8	2.95	0.30
Civil Crew (Clean Up)	Worker	LHD72 Gas	Gas	LHD72 Gas	20	0.25	5	0.25	5	1.84	0.18
Staging Areas	Hauling	HHDT Diesel	Diesel	HHDT Diesel	2	0.25	1	0.25	1	0.18	0.02
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT Diesel	Diesel	HHDT Diesel	2	0.25	1	0.25	1	0.18	0.02
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT Diesel	Diesel	HHDT Diesel	2	0.25	1	0.25	1	0.18	0.02
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT Diesel	Diesel	HHDT Diesel	2	0.25	1	0.25	1	0.18	0.02
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT Diesel	Diesel	HHDT Diesel	7	0.25	2	0.25	2	0.68	0.07
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT Diesel	Diesel	HHDT Diesel	12	0.25	3	0.25	3	1.11	0.11
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT Diesel	Diesel	HHDT Diesel	12	0.25	3	0.25	3	1.11	0.11
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT Diesel	Diesel	HHDT Diesel	12	0.25	3	0.25	3	1.11	0.11
Structure Installation - Spotting	Hauling	HHDT Diesel	Diesel	HHDT Diesel	12	0.25	3	0.25	3	1.11	0.11
Conductor and Wires Installation	Hauling	HHDT Diesel	Diesel	HHDT Diesel	2	0.25	1	0.25	1	0.18	0.02
Civil Crew (Clean Up)	Hauling	HHDT Diesel	Diesel	HHDT Diesel	2	0.25	1	0.25	1	0.18	0.02

Note: Emissions assume a 55% reduction in PM10, as watering twice a day for industrial unpaved roads is 55%. Additional measures that will further reduce PM10 include limiting the max speed to 25 mph (44% reduction), which was also applied.

Total Paved Roadway Dust Emissions - Maximum Daily

	lbs per day	
	PM10	PM2.5
Staging Areas	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	0.00	0.00
Structure Installation - Spotting	0.00	0.00
Conductor and Wires Installation	0.01	0.00
Civil Crew (Clean Up)	0.00	0.00

Total Unpaved Roadway Dust Emissions - Maximum Daily

	lbs per day	
	PM10	PM2.5
Staging Areas	2.03	
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1.94	
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1.48	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	4.92	
Civil Crew (Road Maintenance, BMP's, Gates)	2.89	
Structure Installation - Lattice - Guyed V Framing	3.69	
Structure Installation - Lattice - Guyed V Setting	5.85	
Structure Installation - Monopole and Lattice - 4-Legged	4.06	
Structure Installation - Spotting	2.58	
Conductor and Wires Installation	9.78	
Civil Crew (Clean Up)	2.40	

Mobile Combustion Maximum Daily Emissions - Unpaved Roadways

Phase	Primary Equipment Description	EMFAC Classification	Work Days		EMFAC Emission Factors (g/mile)														Daily Emissions (lb/day)									
			2029	2030	Fuel Type	Speed Bin	Trips Per Day	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM10_PMT W	PM10_PMBW	PM2.5 Exhaust	PM2.5_PMT TW	PM2.5_P MBW	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM10_P MTW	PM10_PMB W	PM10 TOTAL	PM2.5 Exhaust	PM2.5_P MTW	PM2.5_P BW	PM2.5 TOTAL
Staging Areas	1-Ton Truck, 4x4	HHDT	100	-	Diesel	15	8	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.01	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	235	131	Gas	25	3	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	235	131	Gas	25	4	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	210	78	Gas	25	8	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	210	78	Diesel	15	1	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	253	262	Diesel	25	4	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	183	104	Diesel	25	2	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	183	104	Diesel	25	2	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	183	104	Gas	25	2	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	183	104	Diesel	25	4	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	183	104	Gas	25	6	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	183	104	Diesel	15	2	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Spotting	Semi	HHDT	183	104	Diesel	15	2	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	183	104	Diesel	25	2	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	183	104	Diesel	25	2	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	15	6	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.01	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	15	6	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.01	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	52	235	Diesel	15	4	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	52	235	Diesel	25	4	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	52	235	Gas	25	32	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	52	235	Diesel	25	20	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.01	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	-	211	Gas	25	4	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Staging Areas	Worker	LHDT2	100	-	Gas	25	12	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	235	131	Gas	25	16	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	235	131	Gas	25	10	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	210	78	Gas	25	42	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.03	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	253	262	Gas	25	20	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	183	104	Gas	25	24	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	183	104	Gas	25	40	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.03	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	183	104	Gas	25	24	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Spotting	Worker	LHDT2	183	104	Gas	25	10	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Conductor and Wires Installation	Worker	LHDT2	52	235	Gas	25	32	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Clean Up)	Worker	LHDT2	-	211	Gas	25	20	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Staging Areas	Hauling	HHDT	100	-	Diesel	15	2	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	235	131	Diesel	15	2	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	235	131	Diesel	15	2	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	210	78	Diesel	15	2	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	253	262	Diesel	15	7	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.01	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	183	104	Diesel	15	12	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.01	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	183	104	Diesel	15	12	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.01	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	183	104	Diesel	15	12	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.01	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Spotting	Hauling	HHDT	183	104	Diesel	15	12	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.01	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Conductor and Wires Installation	Hauling	HHDT	52	235	Diesel	15	2	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Clean Up)																												

Helicopter Emissions - Maximum Daily

Phase	Type	ROG	NOx	lbs per day				
				CO	SO2	PM10	PM2.5	
Staging Areas	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-
Staging Areas	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	0.78	62.94	12.12	3.90	4.32	-	-
Structure Installation - Lattice - Guyed V Framing	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-
Structure Installation - Spotting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-
Structure Installation - Spotting	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-
Conductor and Wires Installation	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-
Conductor and Wires Installation	Bell 407/MD530F (Light Duty)	1.30	17.50	20.70	1.40	1.00	-	-
Civil Crew (Clean Up)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-
Civil Crew (Clean Up)	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-

Annual Air Quality Calculations

Summary of Project Construction Total Annual Emissions

Construction Phase	Source	2029 Emissions (TPY)						2030 Emissions (TPY)					
		ROG	NOx	CO	SO2	PM10	PM2.5	ROG	NOx	CO	SO2	PM10	PM2.5
Staging Areas	Off-Road Equipment	0.04	0.32	0.49	0.00	0.00	0.00	-	-	-	-	-	-
Staging Areas	Dust from Material Movement	-	-	-	-	-	-	-	-	-	-	-	-
Staging Areas	On-Road Trip Exhaust (Paved)	0.00	0.01	0.01	0.00	0.00	0.00	-	-	-	-	-	-
Staging Areas	On-Road Trip Exhaust (Unpaved)	0.00	0.02	0.01	0.00	0.00	0.00	-	-	-	-	-	-
Staging Areas	On-Road Roadway Dust (Paved)	-	-	-	-	0.00	0.00	-	-	-	-	-	-
Staging Areas	On-Road Roadway Dust (Unpaved)	-	-	-	-	2.87	0.29	-	-	-	-	-	-
Staging Areas	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Off-Road Equipment	0.33	2.63	2.89	0.01	0.04	0.04	0.18	1.47	1.61	0.00	0.02	0.02
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Dust from Material Movement	-	-	-	-	0.65	0.31	-	-	-	-	0.36	0.17
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Trip Exhaust (Paved)	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Trip Exhaust (Unpaved)	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.00	0.00	-	-	-	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	3.67	0.37	-	-	-	-	2.05	0.20
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Off-Road Equipment	0.17	1.25	1.61	0.00	0.02	0.02	0.10	0.69	0.90	0.00	0.01	0.01
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Dust from Material Movement	-	-	-	-	0.30	0.15	-	-	-	-	0.17	0.09
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Trip Exhaust (Paved)	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Trip Exhaust (Unpaved)	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.00	0.00	-	-	-	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	3.67	0.37	-	-	-	-	2.05	0.20
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Off-Road Equipment	0.72	5.07	7.97	0.03	0.08	0.07	0.27	1.88	2.96	0.01	0.03	0.03
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Dust from Material Movement	-	-	-	-	0.13	0.01	-	-	-	-	0.05	0.01
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Trip Exhaust (Paved)	0.00	0.01	0.07	0.00	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Trip Exhaust (Unpaved)	0.00	0.03	0.06	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.01	0.00	-	-	-	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	9.12	0.91	-	-	-	-	3.39	0.34
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Road Equipment	0.24	1.30	1.72	0.01	0.02	0.02	0.25	1.34	1.78	0.01	0.02	0.02
Civil Crew (Road Maintenance, BMP's, Gates)	Dust from Material Movement	-	-	-	-	0.03	0.00	-	-	-	-	0.03	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Trip Exhaust (Paved)	0.00	0.02	0.05	0.00	0.01	0.00	0.00	0.02	0.05	0.00	0.01	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Trip Exhaust (Unpaved)	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Roadway Dust (Paved)	-	-	-	-	0.01	0.00	-	-	-	-	0.01	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Roadway Dust (Unpaved)	-	-	-	-	8.60	0.86	-	-	-	-	8.91	0.89
Civil Crew (Road Maintenance, BMP's, Gates)	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	Off-Road Equipment	0.02	0.13	0.41	0.00	0.00	0.00	0.01	0.08	0.23	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	Dust from Material Movement	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	On-Road Trip Exhaust (Paved)	0.00	0.02	0.03	0.00	0.01	0.00	0.00	0.01	0.02	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	On-Road Trip Exhaust (Unpaved)	0.00	0.05	0.03	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	On-Road Roadway Dust (Paved)	-	-	-	-	0.01	0.00	-	-	-	-	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	On-Road Roadway Dust (Unpaved)	-	-	-	-	8.93	0.89	-	-	-	-	5.08	0.51
Structure Installation - Lattice - Guyed V Framing	Helicopter Use	0.07	5.76	1.11	0.36	0.40	-	0.04	3.27	0.63	0.20	0.22	-
Structure Installation - Lattice - Guyed V Setting	Off-Road Equipment	0.24	1.83	2.39	0.01	0.03	0.03	0.14	1.04	1.36	0.00	0.02	0.02
Structure Installation - Lattice - Guyed V Setting	Dust from Material Movement	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	On-Road Trip Exhaust (Paved)	0.00	0.03	0.03	0.00	0.01	0.00	0.00	0.02	0.02	0.00	0.00	0.00

Construction Phase	Source	2029 Emissions (TPY)						2030 Emissions (TPY)						
		ROG	NOx	CO	SO2	PM10	PM2.5	ROG	NOx	CO	SO2	PM10	PM2.5	
Structure Installation - Lattice - Guyed V Setting	On-Road Trip Exhaust (Unpaved)	0.01	0.06	0.04	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	On-Road Roadway Dust (Paved)	-	-	-	-	0.01	0.00	-	-	-	-	0.01	0.00	
Structure Installation - Lattice - Guyed V Setting	On-Road Roadway Dust (Unpaved)	-	-	-	-	12.26	1.23	-	-	-	-	6.97	0.70	
Structure Installation - Lattice - Guyed V Setting	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-	
Structure Installation - Monopole and Lattice - 4-Legged	Off-Road Equipment	0.06	0.47	0.59	0.00	0.01	0.01	0.03	0.27	0.33	0.00	0.00	0.00	
Structure Installation - Monopole and Lattice - 4-Legged	Dust from Material Movement	-	-	-	-	-	-	-	-	-	-	-	-	
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Trip Exhaust (Paved)	0.00	0.02	0.04	0.00	0.01	0.00	0.00	0.01	0.03	0.00	0.00	0.00	
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Trip Exhaust (Unpaved)	0.00	0.05	0.04	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.00	
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Roadway Dust (Paved)	-	-	-	-	0.01	0.00	-	-	-	-	0.00	0.00	
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Roadway Dust (Unpaved)	-	-	-	-	10.13	1.01	-	-	-	-	5.76	0.58	
Structure Installation - Monopole and Lattice - 4-Legged	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-	
Structure Installation - Spotting	Off-Road Equipment	0.03	0.29	0.28	0.00	0.00	0.00	0.02	0.17	0.16	0.00	0.00	0.00	
Structure Installation - Spotting	Dust from Material Movement	-	-	-	-	-	-	-	-	-	-	-	-	
Structure Installation - Spotting	On-Road Trip Exhaust (Paved)	0.00	0.02	0.02	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00	
Structure Installation - Spotting	On-Road Trip Exhaust (Unpaved)	0.00	0.05	0.02	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	
Structure Installation - Spotting	On-Road Roadway Dust (Paved)	-	-	-	-	0.01	0.00	-	-	-	-	0.00	0.00	
Structure Installation - Spotting	On-Road Roadway Dust (Unpaved)	-	-	-	-	8.26	0.83	-	-	-	-	4.69	0.47	
Structure Installation - Spotting	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-	
Conductor and Wires Installation	Off-Road Equipment	0.44	3.31	3.58	0.01	0.05	0.05	1.97	14.95	16.20	0.05	0.24	0.22	
Conductor and Wires Installation	Dust from Material Movement	-	-	-	-	0.40	0.20	-	-	-	-	1.80	0.93	
Conductor and Wires Installation	On-Road Trip Exhaust (Paved)	0.00	0.02	0.04	0.00	0.01	0.00	0.01	0.09	0.17	0.00	0.03	0.01	
Conductor and Wires Installation	On-Road Trip Exhaust (Unpaved)	0.00	0.04	0.04	0.00	0.00	0.00	0.01	0.18	0.16	0.00	0.01	0.00	
Conductor and Wires Installation	On-Road Roadway Dust (Paved)	-	-	-	-	0.01	0.00	-	-	-	-	0.03	0.01	
Conductor and Wires Installation	On-Road Roadway Dust (Unpaved)	-	-	-	-	8.70	0.87	-	-	-	-	39.30	3.93	
Conductor and Wires Installation	Helicopter Use	0.03	0.46	0.54	0.04	0.03	-	0.15	2.06	2.43	0.16	0.12	-	
Civil Crew (Clean Up)	Off-Road Equipment	-	-	-	-	-	-	0.03	0.17	0.33	0.00	0.00	0.00	
Civil Crew (Clean Up)	Dust from Material Movement	-	-	-	-	-	-	-	-	-	-	-	-	
Civil Crew (Clean Up)	On-Road Trip Exhaust (Paved)	-	-	-	-	-	-	0.00	0.01	0.04	0.00	0.00	0.00	
Civil Crew (Clean Up)	On-Road Trip Exhaust (Unpaved)	-	-	-	-	-	-	0.00	0.01	0.03	0.00	0.00	0.00	
Civil Crew (Clean Up)	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-	-	-	0.00	0.00	
Civil Crew (Clean Up)	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-	-	-	5.09	0.51	
Civil Crew (Clean Up)	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-	

Construction Phase	Source	2029 Emissions (TPY)						2030 Emissions (TPY)					
		ROG	NOx	CO	SO2	PM10	PM2.5	ROG	NOx	CO	SO2	PM10	PM2.5
Overall Project Emissions (California & Arizona)													
Construction Phase	Source	ROG	NOx	CO	SO2	PM10	PM2.5	ROG	NOx	CO	SO2	PM10	PM2.5
Staging Areas	Total	0.04	0.35	0.51	0.00	2.88	0.29	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Total	0.33	2.65	2.94	0.01	4.37	0.72	0	1	2	0	2	0
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Total	0.17	1.26	1.67	0.00	4.00	0.54	0	1	1	0	2	0
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Total	0.72	5.11	8.10	0.03	9.35	1.00	0	2	3	0	3	0
Civil Crew (Road Maintenance, BMP's, Gates)	Total	0.25	1.35	1.81	0.01	8.66	0.88	0	1	2	0	9	1
Structure Installation - Lattice - Guyed V Framing	Total	0.10	5.97	1.58	0.36	9.35	0.90	0	3	1	0	5	1
Structure Installation - Lattice - Guyed V Setting	Total	0.25	1.92	2.46	0.01	12.31	1.26	0	1	1	0	7	1
Structure Installation - Monopole and Lattice - 4-Legged	Total	0.06	0.54	0.67	0.00	10.16	1.03	0	0	0	0	6	1
Structure Installation - Spotting	Total	0.04	0.36	0.33	0.00	8.28	0.84	0	0	0	0	5	0
Conductor and Wires Installation	Total	0.47	3.83	4.20	0.05	9.19	1.13	2	17	19	0	42	5
Civil Crew (Clean Up)	Total	-	-	-	-	-	-	0	0	0	0	5	1
Total													

Construction Phase	Source	2029 Emissions (TPY)						2030 Emissions (TPY)					
		ROG	NOx	CO	SO2	PM10	PM2.5	ROG	NOx	CO	SO2	PM10	PM2.5
Staging Areas	Total	0.003	0.024	0.036	0.000	0.201	0.020	0	0	0	0	0	0
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Total	0.023	0.185	0.206	0.001	0.306	0.051	0.013	0.103	0.115	0.000	0.170	0.028
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Total	0.012	0.088	0.117	0.000	0.280	0.038	0.007	0.049	0.065	0.000	0.156	0.021
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Total	0.050	0.358	0.567	0.002	0.655	0.070	0.019	0.133	0.211	0.001	0.243	0.026
Civil Crew (Road Maintenance, BMP's, Gates)	Total	0.017	0.095	0.127	0.001	0.606	0.062	0.018	0.098	0.131	0.001	0.628	0.064
Structure Installation - Lattice - Guyed V Framing	Total	0.007	0.418	0.110	0.025	0.654	0.063	0.004	0.237	0.063	0.014	0.372	0.036
Structure Installation - Lattice - Guyed V Setting	Total	0.018	0.135	0.172	0.001	0.862	0.088	0.010	0.077	0.098	0.000	0.490	0.050
Structure Installation - Monopole and Lattice - 4-Legged	Total	0.004	0.038	0.047	0.000	0.711	0.072	0.003	0.022	0.027	0.000	0.404	0.041
Structure Installation - Spotting	Total	0.003	0.025	0.023	0.000	0.580	0.058	0.002	0.014	0.013	0.000	0.329	0.033
Conductor and Wires Installation	Total	0.033	0.268	0.294	0.003	0.643	0.079	0.150	1.210	1.327	0.015	2.908	0.357
Civil Crew (Clean Up)	Total	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.013	0.029	0.000	0.357	0.036
Blasting	Total	0.008	0.091	0.231	0.004	0.680	0.041	0.008	0.091	0.231	0.004	0.680	0.041
Total		0.18	1.72	1.93	0.04	6.18	0.64	0.24	2.05	2.31	0.04	6.74	0.73
<i>De Minimis Conformity Thresholds</i>		50	50	100	100	100	100	50	50	100	100	100	100
Exceed?		No	No	No	No	No	No	No	No	No	No	No	No

Method Used to Estimate State Specific Construction Emissions

The project proposes to develop a transmission line from California to Arizona. The Arizona portion of Route 1 was measured using Google Earth; assuming the entire length of the project is 86 miles, this would result in 80 miles (93 percent) of construction occurring in California and 6 miles (7 percent) of transmission line construction occurring in Arizona.

Sources: <https://www.epa.gov/general-conformity/de-minimis-tables>; Thresholds used for ozone and PM10 under the Arizona portion reflect that Yuma County, Arizona is currently in nonattainment for ozone and PM10.

	Percent of total project Miles	
California miles	93%	80
Arizona miles	7%	6
Overall Project miles	100%	86

Daily Acres Graded by Equipment Type

Equipment	Acres Graded per 8 Hours
Crawler Tractors	0.5
Graders	0.5
Rubber Tired Dozers	0.5
Scrapers	1

Source: CalEEMod Appendix G, Table G-14

Grading Emission Factor (lbs/acre/day)		
Pollutant	PM10	PM2.5
S	7.10	7.10
F	0.60	0.03
Wb	12	12
SF per acre	43,560	43,560
Ft per mile	5,280	5,280
Uncontrolled EF	1.06	0.11
Controlled EF	0.41	0.04

Notes: Grading calculations rely upon this equation (acres graded per day x EF) for Loaders & Scrapers; controlled EF assumes 61% reduction in PM from 2x per day watering.
 Source: CalEEMod Appendix C, Section 4.4.1 (pg C-11)

Bulldozing Emission Factor (lbs/hr)		
Pollutant	PM10	PM2.5
C	1.00	5.70
s	6.90	6.90
M	7.90	7.90
F	0.75	0.11
Uncontrolled EF	0.75	0.41
Controlled EF	0.29	0.16

Notes: Bulldozer calculations rely upon this equation (hours per day x emission factor (EF)) for Dozers; controlled EF assumes 61% reduction in PM from 2x per day watering.
 Source: CalEEMod Appendix C, Section 4.4.2 (pg C-12)

Crushing & Blasting Emissions

Crushing & Blasting Assumptions	
Equipment	Per Year
Ammonium nitrate/fuel oil (ANFO) (unit)	84
Pounds of blasting material (lbs)	8400
Crushing and Processing Equipment (unit)	42

Source: Page 15 and 16. Equipment such as Ammonium nitrate/fuel oil (ANFO) would be used as explosives because they are inexpensive and relatively safe. It is assumed 6 blasting events per week and ~18.9 percent of the project timeline (blasting plan structures figure) would utilize blasting equipment.
https://files.ceqanet.lci.ca.gov/267127-2/attachment/8LYXRQ7OYSaZ_DHb4GyF85WanIsrKrixMYSVLQzBFDFQksuO2lgClakgPHzblb54D25ejDyd8UE5hOK0

Blasting Gaseous Emission Factors (pounds per ton)	
Pollutant	Emission Factors
Carbon Monoxide	67
Nitrogen Oxide	17
Sulfur Oxide	2

Notes: Emission factors for Ammonium nitrate/fuel oil (ANFO). Commonly used as explosives because they are inexpensive and relatively safe
 Source: Drilling & Blasting Operations, Page 2. <https://www.sdapcd.org/content/dam/sdapcd/documents/permits/emissions-calculation/mineral-products-industry-drilling-blasting/APCD-blasting.pdf>

Blasting PM10 and PM2.5 Emissions Factors (pounds per	PM10	PM2.5
Constant	0.000014	0.000014
Exponent	1.5	1.5
A (ft ²)	17,000	17,000
Scaling Factor	0.52	0.03

Notes: A is the area blasted. The geometric mean of 17,000 ft² was used to conservatively estimate emissions
<https://www.epa.gov/sites/default/files/2020-10/documents/c11s09.pdf>

Crushing Emission Factors (g/bhp-hr)									
Equipment	Horsepower	Hours per year	Load Factor	ROG	NOx	CO	SOx	PM10	PM2.5
Crushing and Processing Equipment	85	8	0.78	0.345	2.248	3.694	0.0006	0.095	0.095

Source: CalEEMod 2020.4.0. Table 3.4 OFFROAD Equipment Emission Factors.
 Source: USEPA AP-42 11.9. See table 11.9.1 and 11.9.3 https://www.aqmd.gov/docs/default-source/caleemod/user-guide-2021/appendix-d2020-4-0-full-merge.pdf?sfvrsn=e8e1d061_12

Crushing & Blasting Emissions (tons per year)						
Pollutant	ROG	NOx	CO	SOx	PM10	PM2.5
Max Crushing & Blasting Emissions	0.01	0.09	0.23	0.004	0.68	0.04

Offroad Construction Equipment Combustion Emissions Calculations - Annual

CalEEMod Name	HP	Load Factor	Specific Name	Phase	Total Equipment Count for All Crews	Hours Per Day	Total No. of Usage Days	No. of Usage Days - 2029	No. of Usage Days - 2030
Forklifts (medium)	96	0.2	R/T Forklift	Staging Areas	4	8	100	100	0
Generator Sets	45	0.74	Generator	Staging Areas	1	8	100	100	0
Off-Highway Trucks	350	0.38	Water Truck	Staging Areas	1	8	100	100	0
Graders	200	0.41	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131
Rubber Tired Dozers (medium)	200	0.4	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131
Rollers	150	0.38	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131
Excavators (heavy)	450	0.38	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131
Rubber Tired Dozers (medium)	200	0.4	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131
Rollers	150	0.38	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131
Bore/Drill Rigs	500	0.5	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78
Bore/Drill Rigs	400	0.5	LoDril	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78
Tractors/Loaders/Backhoes	150	0.37	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	8	288	210	78
Cranes (heavy)	425	0.29	CRANE 40T	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	8	288	210	78
Other Material Handling Equipment	400	0.4	Material Handler	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	8	515	253	262
Graders	200	0.41	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262
Off-Highway Trucks	335	0.38	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	4	8	287	183	104
Cranes (heavy)	500	0.29	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	4	8	287	183	104
Excavators (medium)	175	0.38	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting	4	8	287	183	104
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	4	8	287	183	104
Forklifts	100	0.2	FORKLIFT 12K	Structure Installation - Monopole and Lattice - 4-Legged	1	9	287	183	104
Cranes	500	0.29	CRANE 160 TON RT	Structure Installation - Monopole and Lattice - 4-Legged	1	10	287	183	104
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Spotting	1	8	287	183	104
Cranes (medium)	270	0.29	CRANE 100 TON RT	Structure Installation - Spotting	1	8	287	183	104
Rubber Tired Dozers (heavy)	350	0.4	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation	4	8	287	52	235
Rubber Tired Dozers (medium)	200	0.4	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	2	8	287	52	235
Other Construction Equipment	500	0.42	HARDLINE PULLER	Conductor and Wires Installation	4	8	287	52	235
Other Construction Equipment (medium)	175	0.42	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation	6	8	287	52	235
Other Construction Equipment	300	0.42	TENSIONER 72" BNDL TRK MNTD	Conductor and Wires Installation	2	8	287	52	235
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Conductor and Wires Installation	4	8	287	52	235
Off-Highway Trucks	400	0.38	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	4	8	287	52	235
Off-Highway Trucks	300	0.38	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	2	8	287	52	235
Cranes (heavy)	425	0.29	CRANE 40T	Conductor and Wires Installation	11	8	287	52	235
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Conductor and Wires Installation	2	8	287	52	235
Off-Highway Trucks	335	0.38	Mechanic Truck	Conductor and Wires Installation	2	8	287	52	235
Excavators (heavy)	450	0.38	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	8	211	0	211

2029 Emissions (TPY)						2030 Emissions (TPY)					
ROG	NOx	CO	SO2	PM10E	PM2.5E	ROG	NOx	CO	SO2	PM10E	PM2.5E
0.01	0.13	0.24	0.00	0.00	0.00	-	-	-	-	-	-
0.01	0.09	0.11	0.00	0.00	0.00	-	-	-	-	-	-
0.02	0.10	0.14	0.00	0.00	0.00	-	-	-	-	-	-
0.07	0.53	0.40	0.00	0.02	0.02	0.04	0.30	0.22	0.00	0.01	0.01
0.15	1.47	1.16	0.00	0.07	0.06	0.08	0.82	0.65	0.00	0.04	0.03
0.09	0.45	0.64	0.00	0.02	0.01	0.05	0.25	0.36	0.00	0.01	0.01
0.03	0.18	0.69	0.00	0.01	0.01	0.01	0.10	0.39	0.00	0.00	0.00
0.04	0.19	0.37	0.00	0.01	0.01	0.02	0.11	0.21	0.00	0.00	0.00
0.07	0.74	0.58	0.00	0.03	0.03	0.04	0.41	0.32	0.00	0.02	0.02
0.05	0.23	0.32	0.00	0.01	0.01	0.03	0.13	0.18	0.00	0.00	0.00
0.01	0.09	0.35	0.00	0.00	0.00	0.01	0.05	0.19	0.00	0.00	0.00
0.13	0.98	1.37	0.01	0.04	0.03	0.05	0.36	0.51	0.00	0.01	0.01
0.11	0.78	1.09	0.01	0.03	0.03	0.04	0.29	0.41	0.00	0.01	0.01
0.09	0.52	1.92	0.00	0.03	0.02	0.03	0.19	0.71	0.00	0.01	0.01
0.25	2.03	2.20	0.01	0.08	0.08	0.09	0.75	0.82	0.00	0.03	0.03
0.12	0.65	1.03	0.00	0.02	0.02	0.04	0.24	0.38	0.00	0.01	0.01
0.02	0.11	0.35	0.00	0.01	0.00	0.01	0.04	0.13	0.00	0.00	0.00
0.15	0.73	1.03	0.00	0.03	0.02	0.16	0.76	1.07	0.00	0.03	0.02
0.04	0.29	0.22	0.00	0.01	0.01	0.04	0.30	0.22	0.00	0.01	0.01
0.01	0.05	0.14	0.00	0.00	0.00	0.01	0.05	0.15	0.00	0.00	0.00
0.05	0.23	0.33	0.00	0.01	0.01	0.05	0.24	0.34	0.00	0.01	0.01
0.02	0.13	0.41	0.00	0.01	0.01	0.01	0.08	0.23	0.00	0.00	0.00
0.17	1.39	1.51	0.00	0.06	0.05	0.10	0.79	0.86	0.00	0.03	0.03
0.05	0.31	0.47	0.00	0.01	0.01	0.03	0.18	0.27	0.00	0.01	0.01
0.02	0.13	0.41	0.00	0.01	0.01	0.01	0.08	0.23	0.00	0.00	0.00
0.01	0.04	0.12	0.00	0.00	0.00	0.00	0.02	0.07	0.00	0.00	0.00
0.05	0.43	0.47	0.00	0.02	0.02	0.03	0.25	0.27	0.00	0.01	0.01
0.01	0.03	0.10	0.00	0.00	0.00	0.00	0.02	0.06	0.00	0.00	0.00
0.03	0.26	0.18	0.00	0.01	0.01	0.02	0.15	0.10	0.00	0.01	0.01
0.09	0.73	0.68	0.00	0.03	0.03	0.39	3.32	3.05	0.01	0.15	0.14
0.03	0.33	0.26	0.00	0.01	0.01	0.15	1.47	1.16	0.00	0.07	0.06
0.06	0.42	0.48	0.00	0.02	0.02	0.25	1.91	2.18	0.01	0.07	0.07
0.04	0.31	0.27	0.00	0.01	0.01	0.17	1.40	1.22	0.00	0.06	0.06
0.02	0.13	0.14	0.00	0.00	0.00	0.08	0.57	0.65	0.00	0.02	0.02
0.01	0.04	0.12	0.00	0.00	0.00	0.03	0.17	0.53	0.00	0.01	0.01
0.05	0.23	0.32	0.00	0.01	0.01	0.22	1.04	1.46	0.01	0.04	0.03
0.02	0.09	0.12	0.00	0.00	0.00	0.08	0.39	0.55	0.00	0.01	0.01
0.11	0.92	1.00	0.00	0.04	0.04	0.51	4.16	4.52	0.01	0.17	0.16
0.00	0.02	0.06	0.00	0.00	0.00	0.01	0.09	0.26	0.00	0.00	0.00
0.02	0.10	0.14	0.00	0.00	0.00	0.09	0.43	0.61	0.00	0.02	0.01
-	-	-	-	-	-	0.03	0.17	0.33	0.00	0.01	0.01

Offroad Construction Equipment Combustion Emissions - Annual

Construction Phase	2029 Emissions (TPY)						2030 Emissions (TPY)					
	ROG	NOx	CO	SO2	PM10E	PM2.5E	ROG	NOx	CO	SO2	PM10E	PM2.5E
Staging Areas	0.04	0.32	0.49	0.00	0.00	0.00	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	0.33	2.63	2.89	0.01	0.04	0.04	0.18	1.47	1.61	0.00	0.02	0.02
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	0.17	1.25	1.61	0.00	0.02	0.02	0.10	0.69	0.90	0.00	0.01	0.01
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	0.72	5.07	7.97	0.03	0.08	0.07	0.27	1.88	2.96	0.01	0.03	0.03
Civil Crew (Road Maintenance, BMP's, Gates)	0.24	1.30	1.72	0.01	0.02	0.02	0.25	1.34	1.78	0.01	0.02	0.02
Structure Installation - Lattice - Guyed V Framing	0.02	0.13	0.41	0.00	0.00	0.00	0.01	0.08	0.23	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	0.24	1.83	2.39	0.01	0.03	0.03	0.14	1.04	1.36	0.00	0.02	0.02
Structure Installation - Monopole and Lattice - 4-Legged	0.06	0.47	0.59	0.00	0.01	0.01	0.03	0.27	0.33	0.00	0.00	0.00
Structure Installation - Spotting	0.03	0.29	0.28	0.00	0.00	0.00	0.02	0.17	0.16	0.00	0.00	0.00
Conductor and Wires Installation	0.44	3.31	3.58	0.01	0.05	0.05	1.97	14.95	16.20	0.05	0.24	0.22
Civil Crew (Clean Up)	-	-	-	-	-	-	0.03	0.17	0.33	0.00	0.00	0.00

Grading & Material Movement Calculations - Annual

	Equipment	Lookup	No. of Equipment	Hours Per Day (for Dozers)	Acres Graded (for Grading Equipment)	2029 Emissions (TPY)		2030 Emissions (TPY)	
						PM10	PM2.5	PM10	PM2.5
Staging Areas	Forklifts (medium)		4	-	-	-	-	-	
Staging Areas	Generator Sets		1	-	-	-	-	-	
Staging Areas	Off-Highway Trucks		1	-	-	-	-	-	
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Graders	Graders	2	-	0.50	0.05	0.01	0.03	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Rubber Tired Dozers (medium)	Rubber Tired Dozers	2	8	0.50	0.60	0.31	0.33	0.17
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Off-Highway Trucks		2	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Rollers		2	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Excavators (heavy)		1	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Rubber Tired Dozers (medium)	Rubber Tired Dozers	1	8	0.50	0.30	0.15	0.17	0.09
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Off-Highway Trucks		1	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Rollers		1	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bore/Drill Rigs		3	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bore/Drill Rigs		3	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Tractors/Loaders/Backhoes	Crawler Tractors	6	-	0.50	0.13	0.01	0.05	0.01
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Cranes (heavy)		6	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Other Material Handling Equipment		3	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Forklifts (Heavy)		3	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Highway Trucks		3	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Graders	Graders	1	-	0.50	0.03	0.00	0.03	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	Forklifts (Heavy)		1	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Highway Trucks		1	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	Forklifts (Heavy)		4	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Cranes (heavy)		4	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Excavators (medium)		4	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Forklifts (Heavy)		4	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Forklifts		1	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Cranes		1	-	-	-	-	-	-
Structure Installation - Spotting	Forklifts (Heavy)		1	-	-	-	-	-	-
Structure Installation - Spotting	Cranes (medium)		1	-	-	-	-	-	-
Conductor and Wires Installation	Rubber Tired Dozers (heavy)	Rubber Tired Dozers	4	8	0.50	0.27	0.14	1.20	0.62
Conductor and Wires Installation	Rubber Tired Dozers (medium)	Rubber Tired Dozers	2	8	0.50	0.13	0.07	0.60	0.31
Conductor and Wires Installation	Other Construction Equipment		4	-	-	-	-	-	-
Conductor and Wires Installation	Other Construction Equipment (medium)		6	-	-	-	-	-	-
Conductor and Wires Installation	Other Construction Equipment		2	-	-	-	-	-	-
Conductor and Wires Installation	Forklifts (Heavy)		4	-	-	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		4	-	-	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		2	-	-	-	-	-	-
Conductor and Wires Installation	Cranes (heavy)		11	-	-	-	-	-	-
Conductor and Wires Installation	Forklifts (Heavy)		2	-	-	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		2	-	-	-	-	-	-
Civil Crew (Clean Up)	Excavators (heavy)		1	-	-	-	-	-	-

Grading & Material Movement - Annual

Construction Phase	2029 Emissions (TPY)		2030 Emissions (TPY)	
	PM10	PM2.5	PM10	PM2.5
Staging Areas	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	0.65	0.31	0.36	0.17
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	0.30	0.15	0.17	0.09
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	0.13	0.01	0.05	0.01
Civil Crew (Road Maintenance, BMP's, Gates)	0.03	0.00	0.03	0.00
Structure Installation - Lattice - Guyed V Framing	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	-	-	-	-
Structure Installation - Spotting	-	-	-	-
Conductor and Wires Installation	0.40	0.20	1.80	0.93
Civil Crew (Clean Up)	-	-	-	-

Paved Roadway Dust Emission Factors

Paved	PM10 (lb/mile)	PM2.5 (lb/mile)
K	1	0.25
sL	0.1	0.1
W	2.4	2.4
P	2	2
N	365	365
Emission Factor Controlled	0.00030	0.00007
Emission Factor Uncontrolled	0.00066	0.00017

Notes: Used the Controlled emissions factor, which assumes watering twice a day, resulting in a 55% reduction in PM10.
Source: CalEEMod Appendix C, Section 5.14 (page C-45)

Unpaved Roadway Dust Emission Factors

Unpaved	LHD2 Diesel 25mph		LHD2 Gas 25 mph		HHDT Diesel		HHDT Diesel 15 mph	
	PM10 (lb/mile)	PM2.5 (lb/mile)	PM10 (lb/mile)	PM2.5 (lb/mile)	PM10 (lb/mile)	PM2.5 (lb/mile)	PM10 (lb/mile)	PM2.5 (lb/mile)
K	816.47	81.65	816.47	81.65	816.47	81.65	816.47	81.65
sL	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50
M	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
P	2	2	2	2	2	2	2	2
S	40	40	40	40	40	40	40	40
C	0.14	0.05	0.09	0.03	0.09	0.03	0.09	0.03
Emission Factor Controlled (Calculated)	0.37	0.04	0.37	0.04	0.37	0.04	0.37	0.04
Emission Factor Uncontrolled (CARB Default)	2	0.2	2	0.2	2	0.2	2	0.2
Emission Factor Uncontrolled (Calculated)	1.46	0.15	1.46	0.15	1.46	0.15	1.46	0.15

Notes: Used the Controlled emissions factor, which assumes watering twice a day, resulting in a 55% reduction in PM10.
Source: CalEEMod Appendix C, Section 5.14 (page C-45); https://www.caleemod.com/documents/user-guide/D4_Appendix%20C.pdf

$$EF_{unpaved} = \left(\frac{k(s/12)^1 (S/30)^{0.5}}{(M/0.5)^{0.2}} - C \right) \times \left(1 - \frac{P}{365} \right)$$

Roadway Dust Annual Emission Estimates

Paved Trips Roadway Dust

Unpaved Trips Roadway Dust

Phase	Primary Equipment Description	EMFAC Classification	Work Days		Fuel Type	Identifier for EF	Paved Trips			Unpaved Trips Roadway Dust				Unpaved Trips											
			2029	2030			Annual VMT (miles/year)		2029 Annual Emissions (tons/year)		2030 Annual Emissions (tons/year)		Annual VMT (miles/year)		2029 Annual Emissions (tons/year)		2030 Annual Emissions (tons/year)								
			Trips Per Day	Trip Length (miles)			Daily VMT (miles/day)	PM10	PM2.5	PM10	PM2.5	Trips Per Day	Trip Length (miles)	Daily VMT (miles/day)	PM10	PM2.5	PM10	PM2.5							
Staging Areas	I-Ton Truck, 4x4	HHDT	100	-	Diesel	HHDT Diesel	8	10	80	8,000	-	1.19E-03	2.98E-04	0.00E+00	0.00E+00	8	10	80	8,000	-	1.48	0.15	-	-	
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHD2	235	-	Gas	LHD2 Gas	6	5	28	6,514	3,631	9.70E-04	2.42E-04	5.41E-04	1.35E-04	6	5	28	6,514	3,631	1.20	0.12	0.67	0.07	
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHD2	235	-	Gas	LHD2 Gas	4	5	18	4,343	2,421	6.46E-04	1.62E-04	3.50E-04	9.01E-05	4	5	18	4,343	2,421	0.80	0.08	0.45	0.04	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHD2	210	-	Gas	LHD2 Gas	24	5	111	23,285	8,649	3.47E-03	8.66E-04	1.29E-03	3.22E-04	24	5	111	23,285	8,649	4.30	0.43	1.60	0.16	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	210	-	Diesel	HHDT Diesel	4	10	40	8,400	3,120	1.25E-03	3.13E-04	4.64E-04	1.16E-04	4	10	40	8,400	3,120	1.55	0.15	0.58	0.06	
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHD2	253	-	Diesel	LHD2 Diesel	4	5	18	4,675	4,842	6.96E-04	1.74E-04	7.21E-04	1.80E-04	4	5	18	4,675	4,842	0.86	0.09	0.89	0.09	
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHD2	183	-	Diesel	LHD2 Diesel	8	10	80	14,640	8,320	2.18E-03	5.45E-04	1.24E-03	3.10E-04	8	10	80	14,640	8,320	2.70	0.27	1.53	0.15	
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIE	LHD2	183	-	Diesel	LHD2 Diesel	8	5	37	6,764	3,844	1.01E-03	2.52E-04	5.72E-04	1.43E-04	8	5	37	6,764	3,844	1.25	0.12	0.71	0.07	
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHD2	183	-	Gas	LHD2 Gas	8	5	37	6,764	3,844	1.01E-03	2.52E-04	5.72E-04	1.43E-04	8	5	37	6,764	3,844	1.25	0.12	0.71	0.07	
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRI	LHD2	183	-	Diesel	LHD2 Diesel	16	10	160	29,280	16,640	4.36E-03	1.09E-03	2.48E-03	6.19E-04	16	10	160	29,280	16,640	5.40	0.54	3.07	0.31	
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHD2	183	-	Gas	LHD2 Gas	18	5	83	15,218	8,649	2.27E-03	5.66E-04	1.29E-03	3.22E-04	18	5	83	15,218	8,649	2.81	0.28	1.60	0.16	
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIE	HHDT	183	-	Diesel	HHDT Diesel	6	10	60	10,980	6,240	1.63E-03	4.09E-04	9.29E-04	2.32E-04	6	10	60	10,980	6,240	2.03	0.20	1.15	0.12	
Structure Installation - Spotting	Semi	HHDT	183	-	Diesel	HHDT Diesel	6	10	60	10,980	6,240	1.63E-03	4.09E-04	9.29E-04	2.32E-04	6	10	60	10,980	6,240	2.03	0.20	1.15	0.12	
Structure Installation - Spotting	PICKUP 1 TON DIE	LHD2	183	-	Diesel	LHD2 Diesel	2	5	9	1,691	961	2.52E-04	6.29E-05	1.43E-04	3.58E-05	2	5	9	1,691	961	0.31	0.03	0.18	0.02	
Structure Installation - Spotting	PICKUP 3/4 TON	LHD2	183	-	Diesel	LHD2 Diesel	2	5	9	1,691	961	2.52E-04	6.29E-05	1.43E-04	3.58E-05	2	5	9	1,691	961	0.31	0.03	0.18	0.02	
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	-	Diesel	HHDT Diesel	12	10	120	6,240	28,200	9.29E-04	2.32E-04	4.20E-03	1.05E-03	12	10	120	6,240	28,200	1.15	0.12	5.20	0.52	
Conductor and Wires Installation	SEMI - ON/OFF ROAD	HHDT	52	-	Diesel	HHDT Diesel	12	10	120	6,240	28,200	9.29E-04	2.32E-04	4.20E-03	1.05E-03	12	10	120	6,240	28,200	1.15	0.12	5.20	0.52	
Conductor and Wires Installation	PICKUP 1 TON DIE	LHD2	52	-	Diesel	LHD2 Diesel	8	10	80	4,160	18,800	6.19E-04	1.55E-04	2.80E-03	7.00E-04	8	10	80	4,160	18,800	0.77	0.08	3.47	0.35	
Conductor and Wires Installation	PICKUP 3/4 TON DIE	LHD2	52	-	Diesel	LHD2 Diesel	8	5	37	1,922	8,686	2.86E-04	7.15E-05	1.29E-03	3.23E-04	8	5	37	1,922	8,686	0.35	0.04	1.60	0.16	
Conductor and Wires Installation	PICKUP 3/4 TON DIE	LHD2	52	-	Gas	LHD2 Gas	64	5	296	15,375	69,485	2.29E-03	5.72E-04	1.03E-02	2.59E-03	64	5	296	15,375	69,485	2.84	0.28	12.82	1.28	
Conductor and Wires Installation	PICKUP WINCH TRI	LHD2	52	-	Diesel	LHD2 Diesel	40	5	185	9,610	43,428	1.43E-03	3.58E-04	6.46E-03	1.62E-03	40	5	185	9,610	43,428	1.77	0.18	8.01	0.80	
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHD2	-	-	Gas	LHD2 Gas	4	5	18	-	3,899	0.00E+00	0.00E+00	5.80E-04	1.45E-04	4	5	18	-	3,899	-	-	-	0.72	0.07
Staging Areas	Worker	LHD2	100	-	Gas	LHD2 Gas	12	5	55	5,544	-	8.25E-04	2.06E-04	0.00E+00	0.00E+00	12	5	55	5,544	-	1.02	0.10	-	-	
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHD2	235	-	Gas	LHD2 Gas	8	5	37	8,686	4,842	1.29E-03	3.23E-04	7.21E-04	1.80E-04	8	5	37	8,686	4,842	1.60	0.16	0.89	0.09	
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHD2	235	-	Gas	LHD2 Gas	10	5	46	10,857	6,052	1.62E-03	4.04E-04	9.01E-04	2.25E-04	10	5	46	10,857	6,052	2.00	0.20	1.12	0.11	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHD2	210	-	Gas	LHD2 Gas	14	5	65	13,583	5,045	2.02E-03	5.05E-04	7.51E-04	1.88E-04	14	5	65	13,583	5,045	2.51	0.25	0.93	0.09	
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHD2	253	-	Gas	LHD2 Gas	20	5	92	23,377	24,209	3.48E-03	8.70E-04	3.60E-03	9.01E-04	20	5	92	23,377	24,209	4.31	0.43	4.47	0.45	
Structure Installation - Lattice - Guyed V Framing	Worker	LHD2	183	-	Gas	LHD2 Gas	6	5	28	5,073	2,883	7.55E-04	1.89E-04	4.29E-04	1.07E-04	6	5	28	5,073	2,883	0.94	0.09	0.53	0.05	
Structure Installation - Lattice - Guyed V Setting	Worker	LHD2	183	-	Gas	LHD2 Gas	10	5	46	8,455	4,805	1.26E-03	3.15E-04	7.15E-04	1.79E-04	10	5	46	8,455	4,805	1.56	0.16	0.89	0.09	
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHD2	183	-	Gas	LHD2 Gas	8	5	37	6,764	3,844	1.01E-03	2.52E-04	5.72E-04	1.43E-04	8	5	37	6,764	3,844	1.25	0.12	0.71	0.07	
Structure Installation - Spotting	Worker	LHD2	183	-	Gas	LHD2 Gas	10	5	46	8,455	4,805	1.26E-03	3.15E-04	7.15E-04	1.79E-04	10	5	46	8,455	4,805	1.56	0.16	0.89	0.09	
Conductor and Wires Installation	Worker	LHD2	52	-	Gas	LHD2 Gas	11	5	49	2,563	11,581	3.81E-04	9.54E-05	1.72E-03	4.31E-04	11	5	49	2,563	11,581	0.47	0.05	2.14	0.21	
Civil Crew (Clean Up)	Worker	LHD2	-	-	Gas	LHD2 Gas	20	5	92	-	19,496	0.00E+00	0.00E+00	2.90E-03	7.25E-04	20	5	92	-	19,496	-	-	-	3.60	0.36
Staging Areas	Hauling	HHDT	100	-	Diesel	HHDT Diesel	2	10	20	2,000	-	2.98E-04	7.44E-05	0.00E+00	0.00E+00	2	10	20	2,000	-	0.37	0.04	-	-	
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	235	-	Diesel	HHDT Diesel	2	10	20	4,700	2,620	7.00E-04	1.75E-04	3.90E-04	9.75E-05	2	10	20	4,700	2,620	0.87	0.09	0.48	0.05	
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	235	-	Diesel	HHDT Diesel	2	10	20	4,700	2,620	7.00E-04	1.75E-04	3.90E-04	9.75E-05	2	10	20	4,700	2,620	0.87	0.09	0.48	0.05	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	210	-	Diesel	HHDT Diesel	2	10	20	4,200	1,560	6.25E-04	1.56E-04	2.32E-04	5.81E-05	2	10	20	4,200	1,560	0.77	0.08	0.29	0.03	
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	253	-	Diesel	HHDT Diesel	7	10	73	18,570	19,230	2.76E-03	6.91E-04	2.86E-03	7.16E-04	7	10	73	18,570	19,230	3.43	0.34	3.55	0.35	
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	183	-	Diesel	HHDT Diesel	12	10																	

Total Paved Roadway Dust Emissions - Annual

	2029		2030	
	Annual Emissions (tons/year)		Annual Emissions (tons/year)	
	PM10	PM2.5	PM10	PM2.5
Staging Areas	2.31E-03	5.78E-04	0.00E+00	0.00E+00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2.96E-03	7.41E-04	1.65E-03	4.13E-04
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	2.96E-03	7.41E-04	1.65E-03	4.13E-04
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	7.36E-03	1.84E-03	2.73E-03	6.84E-04
Civil Crew (Road Maintenance, BMP's, Gates)	6.94E-03	1.73E-03	7.19E-03	1.80E-03
Structure Installation - Lattice - Guyed V Framing	7.21E-03	1.80E-03	4.10E-03	1.02E-03
Structure Installation - Lattice - Guyed V Setting	9.89E-03	2.47E-03	5.62E-03	1.41E-03
Structure Installation - Monopole and Lattice - 4-Legged	8.17E-03	2.04E-03	4.65E-03	1.16E-03
Structure Installation - Spotting	6.66E-03	1.67E-03	3.79E-03	9.47E-04
Conductor and Wires Installation	7.02E-03	1.75E-03	3.17E-02	7.93E-03
Civil Crew (Clean Up)	0.00E+00	0.00E+00	4.11E-03	1.03E-03

Total Unpaved Roadway Dust Emissions - Annual

	2029		2030	
	Annual Emissions (tons/year)		Annual Emissions (tons/year)	
	PM10	PM2.5	PM10	PM2.5
Staging Areas	2.87	0.29	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	3.67	0.37	2.05	0.20
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	3.67	0.37	2.05	0.20
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	9.12	0.91	3.39	0.34
Civil Crew (Road Maintenance, BMP's, Gates)	8.60	0.86	8.91	0.89
Structure Installation - Lattice - Guyed V Framing	8.93	0.89	5.08	0.51
Structure Installation - Lattice - Guyed V Setting	12.26	1.23	6.97	0.70
Structure Installation - Monopole and Lattice - 4-Legged	10.13	1.01	5.76	0.58
Structure Installation - Spotting	8.26	0.83	4.69	0.47
Conductor and Wires Installation	8.70	0.87	39.30	3.93
Civil Crew (Clean Up)	-	-	5.09	0.51

Constructi on Phase	2029 Annual Emissions (TPY)											2030 Annual Emissions (TPY)													
	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM10_PMTW	PM10_PM BW	PM10 TOTAL	PM2.5 Exhaust	PM2.5_P MTW	PM2.5_P MBW	PM2.5 TOTAL	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM10_PMTW	PM10_P MBW	PM10 TOTAL	PM2.5 Exhaust	PM2.5_PMTW	PM2.5_P MBW	PM2.5 TOTAL	
Staging Areas	0.00	0.02	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Ro)	0.00	0.01	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.01	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	
Civil Crew (Ro)	0.00	0.01	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.01	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	
Civil Crew (Ro)	0.00	0.03	0.06	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.01	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	
Civil Crew (Ro)	0.00	0.04	0.04	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.04	0.04	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	
Structure Insts	0.00	0.05	0.03	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.03	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	
Structure Insts	0.01	0.06	0.04	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.03	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	
Structure Insts	0.00	0.05	0.04	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.03	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	
Structure Insts	0.00	0.05	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.03	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	
Conductor and Civil Crew (Cl	0.00	0.04	0.04	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.01	0.18	0.16	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00	
	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	0.03	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	

Helicopter Type and Usage

Type	Engine	HP	Fuel Consumption (gallons/hr)
UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	GECT7-2A	4380	133
Bell 407/MD530F (Light Duty)	Alison 250-C20B	420	28

Source: Fuel Consumption is obtained from the U.S. Department of Interior National Business Center (2006)

Helicopter Emission Factors

Helicopter Emission Factor Type	HC	lbs/hr					lbs/gallon	
		NOx	CO	SOx	PM10	CO2		
UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	0.13	10.49	2.02	0.65	0.72	18.355		
Bell 407/MD530F (Light Duty)	0.08	1.75	2.07	0.14	0.1	18.355		

Source: Emission factors for HC, NOx, CO, and SOx were obtained from the California Public Utilities Commission (2007); PM10 emission factors were obtained from the CPUC (2006); and CO2 emission factor for aviation gasoline was obtained from the U.S. Department of Energy (2008).

Note: Emission factors for Sikorsky UH-60A Blackhawk/Boeing CH-47D Chinook were derived from the emission factors for H-53 Super Stallion (T64-GE-416 Turboshaft 4,380 hp engine). Emission factors for take-off and climb-out modes were used. Emission factors for Bell 407/MD530F were derived from the emission factors for Bell 206 Jet Ranger (Alison 250-C20 Turboshaft 420 hp engine). Emission factors for take-off mode were used.

Helicopter Usage Schedule

Phase	Type	Hours per Day	Number of Helicopters		Total Days of Helicopter Usage	
			Helicopters	Days	2029	2030
Staging Areas	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	100	-
Staging Areas	Bell 407/MD530F (Light Duty)	-	-	-	100	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Bell 407/MD530F (Light Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Bell 407/MD530F (Light Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	210	78
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bell 407/MD530F (Light Duty)	-	-	-	210	78
Civil Crew (Road Maintenance, BMP's, Gates)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	253	262
Civil Crew (Road Maintenance, BMP's, Gates)	Bell 407/MD530F (Light Duty)	-	-	-	253	262
Structure Installation - Lattice - Guyed V Framing	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	6	1	287	183	104
Structure Installation - Lattice - Guyed V Framing	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Lattice - Guyed V Setting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Lattice - Guyed V Setting	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Monopole and Lattice - 4-Legged	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Monopole and Lattice - 4-Legged	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Spotting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Spotting	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Conductor and Wires Installation	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	52	235
Conductor and Wires Installation	Bell 407/MD530F (Light Duty)	5	2	235	52	235
Civil Crew (Clean Up)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	211
Civil Crew (Clean Up)	Bell 407/MD530F (Light Duty)	-	-	-	-	211

Helicopter Emissions - Annual

Helicopter Emissions		lbs per day						2029 Emissions (TPY)						2030 Emissions (TPY)					
Phase	Type	ROG	NOx	CO	SO2	PM10	PM2.5	ROG	NOx	CO	SO2	PM10E	PM2.5E	ROG	NOx	CO	SO2	PM10E	PM2.5E
Staging Areas	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Staging Areas	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	0.78	62.94	12.12	3.90	4.32	-	0.07	5.76	1.11	0.36	0.40	-	0.04	3.27	0.63	0.20	0.22	-
Structure Installation - Lattice - Guyed V Framing	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Spotting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Spotting	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductor and Wires Installation	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductor and Wires Installation	Bell 407/MD530F (Light Duty)	1.30	17.50	20.70	1.40	1.00	-	0.03	0.46	0.54	0.04	0.03	-	0.15	2.06	2.43	0.16	0.12	-
Civil Crew (Clean Up)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Clean Up)	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Greenhouse Gas Calculations

Summary of Project Construction Total Annual Emissions

Construction Phase	Source	2029 MT/Year				2030 MT/Year			
		CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
Staging Areas	Off-Road Equipment	104.12	0.00	0.00	104.47	-	-	-	-
Staging Areas	Dust from Material Movement	-	-	-	-	-	-	-	-
Staging Areas	On-Road Trip Exhaust (Paved)	8.78	0.00	0.00	9.93	-	-	-	-
Staging Areas	On-Road Trip Exhaust (Unpaved)	23.74	0.00	0.00	24.95	-	-	-	-
Staging Areas	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Staging Areas	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Staging Areas	Helicopter Use	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Off-Road Equipment	701.08	0.03	0.01	703.36	390.81	0.02	0.00	392.08
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Dust from Material Movement	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Trip Exhaust (Paved)	11.84	0.00	0.00	12.43	6.60	0.00	0.00	6.93
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Trip Exhaust (Unpaved)	21.99	0.00	0.00	22.61	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Helicopter Use	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Off-Road Equipment	438.75	0.02	0.00	440.17	244.58	0.01	0.00	245.37
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Dust from Material Movement	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Trip Exhaust (Paved)	11.84	0.00	0.00	12.43	6.60	0.00	0.00	6.93
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Trip Exhaust (Unpaved)	21.99	0.00	0.00	22.61	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Helicopter Use	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Off-Road Equipment	2,618.63	0.10	0.02	2,627.20	972.64	0.04	0.01	975.82
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Dust from Material Movement	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Trip Exhaust (Paved)	29.37	0.00	0.01	30.94	10.91	0.00	0.00	11.49
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Trip Exhaust (Unpaved)	55.62	0.00	0.01	57.26	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Helicopter Use	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Road Equipment	675.00	0.03	0.01	677.18	699.01	0.03	0.01	701.27
Civil Crew (Road Maintenance, BMP's, Gates)	Dust from Material Movement	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Trip Exhaust (Paved)	26.84	0.00	0.01	29.55	27.79	0.00	0.01	30.60
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Trip Exhaust (Unpaved)	58.78	0.00	0.01	61.61	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Helicopter Use	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	Off-Road Equipment	61.97	0.00	0.00	62.17	35.22	0.00	0.00	35.33
Structure Installation - Lattice - Guyed V Framing	Dust from Material Movement	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	On-Road Trip Exhaust (Paved)	26.96	0.00	0.01	31.12	15.32	0.00	0.01	17.69
Structure Installation - Lattice - Guyed V Framing	On-Road Trip Exhaust (Unpaved)	62.63	0.00	0.01	66.94	35.59	0.00	0.01	38.04
Structure Installation - Lattice - Guyed V Framing	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	Helicopter Use	1,340.23	-	-	1,340.23	761.66	-	-	761.66
Structure Installation - Lattice - Guyed V Setting	Off-Road Equipment	717.30	0.03	0.01	719.63	407.64	0.02	0.00	408.97
Structure Installation - Lattice - Guyed V Setting	Dust from Material Movement	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	On-Road Trip Exhaust (Paved)	36.91	0.00	0.02	42.74	20.98	0.00	0.01	24.29

Construction Phase	Source	2029 MT/Year				2030 MT/Year			
		CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
Structure Installation - Lattice - Guyed V Setting	On-Road Trip Exhaust (Unpaved)	76.33	0.00	0.02	82.30	43.38	0.00	0.01	46.77
Structure Installation - Lattice - Guyed V Setting	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Helicopter Use	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Off-Road Equipment	157.83	0.01	0.00	158.34	89.70	0.00	0.00	89.99
Structure Installation - Monopole and Lattice - 4-Legged	Dust from Material Movement	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Trip Exhaust (Paved)	31.20	0.00	0.01	35.00	17.73	0.00	0.01	19.89
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Trip Exhaust (Unpaved)	68.66	0.00	0.01	72.60	39.02	0.00	0.01	41.26
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Helicopter Use	-	-	-	-	-	-	-	-
Structure Installation - Spotting	Off-Road Equipment	76.15	0.00	0.00	76.39	43.27	0.00	0.00	43.41
Structure Installation - Spotting	Dust from Material Movement	-	-	-	-	-	-	-	-
Structure Installation - Spotting	On-Road Trip Exhaust (Paved)	24.74	0.00	0.01	28.86	14.06	0.00	0.01	16.40
Structure Installation - Spotting	On-Road Trip Exhaust (Unpaved)	59.51	0.00	0.01	63.78	33.82	0.00	0.01	36.25
Structure Installation - Spotting	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Structure Installation - Spotting	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Structure Installation - Spotting	Helicopter Use	-	-	-	-	-	-	-	-
Conductor and Wires Installation	Off-Road Equipment	1,063.73	0.04	0.01	1,067.18	4,807.23	0.19	0.04	4,822.85
Conductor and Wires Installation	Dust from Material Movement	-	-	-	-	-	-	-	-
Conductor and Wires Installation	On-Road Trip Exhaust (Paved)	26.72	0.00	0.01	30.08	120.74	0.00	0.05	135.92
Conductor and Wires Installation	On-Road Trip Exhaust (Unpaved)	57.47	0.00	0.01	60.94	259.71	0.00	0.05	275.41
Conductor and Wires Installation	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Conductor and Wires Installation	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Conductor and Wires Installation	Helicopter Use	121.48	-	-	121.48	603.88	-	-	603.88
Civil Crew (Clean Up)	Off-Road Equipment	-	-	-	-	152.44	0.01	0.00	152.93
Civil Crew (Clean Up)	Dust from Material Movement	-	-	-	-	-	-	-	-
Civil Crew (Clean Up)	On-Road Trip Exhaust (Paved)	-	-	-	-	16.60	0.00	0.00	17.17
Civil Crew (Clean Up)	On-Road Trip Exhaust (Unpaved)	-	-	-	-	28.13	0.00	0.00	28.72
Civil Crew (Clean Up)	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Civil Crew (Clean Up)	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Civil Crew (Clean Up)	Helicopter Use	-	-	-	-	-	-	-	-

Construction Phase	Source	2029 MT/Year				2030 MT/Year			
		CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
Overall Project Emissions (California & Arizona)									
Construction Phase	Source	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
Staging Areas	Total	137	0.0042	0.0087	139	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Total	735	0.0280	0.0093	738	397	0.0156	0.0041	399
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Total	473	0.0176	0.0074	475	251	0.0098	0.0030	252
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Total	2,704	0.1052	0.0307	2,715	984	0.0390	0.0094	987
Civil Crew (Road Maintenance, BMP's, Gates)	Total	761	0.0271	0.0236	768	727	0.0279	0.0147	732
Structure Installation - Lattice - Guyed V Framing	Total	1,492	0.0028	0.0289	1,500	848	0.0016	0.0164	853
Structure Installation - Lattice - Guyed V Setting	Total	831	0.0290	0.0450	845	472	0.0165	0.0256	480
Structure Installation - Monopole and Lattice - 4-Legged	Total	258	0.0067	0.0271	266	146	0.0038	0.0154	151
Structure Installation - Spotting	Total	160	0.0033	0.0287	169	91	0.0019	0.0163	96
Conductor and Wires Installation	Total	1,269	0.0428	0.0309	1,280	5,792	0.1933	0.1398	5,838
Civil Crew (Clean Up)	Total	-	-	-	-	197	0.0063	0.0050	199
Total		8,896.45				9,987			

Construction Phase	Source	2029 MT/Year				2030 MT/Year			
		CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
Staging Areas	Total	9.565	0.000	0.001	9.754	0	0	0	0.000
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Total	51.444	0.002	0.001	51.688	27.819	0.001	0.000	27.931
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Total	33.081	0.001	0.001	33.265	17.583	0.001	0.000	17.661
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Total	189.254	0.007	0.002	190.077	68.848	0.003	0.001	69.111
Civil Crew (Road Maintenance, BMP's, Gates)	Total	53.243	0.002	0.002	53.784	50.876	0.002	0.001	51.231
Structure Installation - Lattice - Guyed V Framing	Total	104.425	0.000	0.002	105.032	59.345	0.000	0.001	59.690
Structure Installation - Lattice - Guyed V Setting	Total	58.138	0.002	0.003	59.127	33.040	0.001	0.002	33.602
Structure Installation - Monopole and Lattice - 4-Legged	Total	18.038	0.000	0.002	18.615	10.251	0.000	0.001	10.579
Structure Installation - Spotting	Total	11.228	0.000	0.002	11.832	6.381	0.000	0.001	6.724
Conductor and Wires Installation	Total	88.857	0.003	0.002	89.577	405.410	0.014	0.010	408.663
Civil Crew (Clean Up)	Total	0.000	0.000	0.000	0.000	13.802	0.000	0.000	13.918
Blasting	Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total		617.27	0.02	0.02	622.75	693.35	0.02	0.02	699.11

Method Used to Estimate State Specific Construction Emissions
The project proposes to develop a transmission line from California to Arizona. The Arizona portion of Route 1 was measured using Google Earth; assuming the entire length of the project is 86 miles, this would result in 80 miles (93 percent) of construction occurring in California and 6 miles (7 percent) of transmission line construction occurring in Arizona.
Sources: <https://www.epa.gov/general-conformity/de-minimis-tables>; Thresholds used for ozone and PM10 under the Arizona portion reflect that Yuma County, Arizona is currently in nonattainment for ozone and PM10.

	Percent of total project
California miles	93%
Arizona miles	7%
Overall Project miles	100%

Estimated Construction Equipment Counts for All Crews & Usage Days by Phase

Identifier	Equipment	HP	Specific Name	Phase	Total Equipment Count for All Crews	Total No. of Usage Days	No. of Usage Days - 2029	No. of Usage Days - 2030
R/T Forklift Staging A	Forklifts (medium)	96	R/T Forklift	Staging Areas	4	100	100	-
Generator Staging Ar	Generator Sets	45	Generator	Staging Areas	1	100	100	-
Water Truck Staging	Off-Highway Trucks	350	Water Truck	Staging Areas	1	100	100	-
GRADER 150 AWD Ci	Graders	200	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
DOZER D6 Civil Crew	Rubber Tired Dozers (medium)	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
Water Truck Civil Cre	Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
ROLLER Civil Crew (R	Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
EXCAVATOR>100,000	Excavators (heavy)	450	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
DOZER D6 Civil Crew	Rubber Tired Dozers (medium)	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Water Truck Civil Cre	Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
ROLLER Civil Crew (R	Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
IMT Drill Civil Crew (I	Bore/Drill Rigs	500	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
LoDril Civil Crew (Ro	Bore/Drill Rigs	400	LoDril	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
Backhoe Civil Crew (I	Tractors/Loaders/Backhoes	150	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	288	210	78
CRANE 40T Civil Crev	Cranes (heavy)	425	CRANE 40T	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	288	210	78
Material Handler Civ	Other Material Handling Equipment	400	Material Handler	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
SKID STEER & FORKS	Forklifts (Heavy)	100	SKID STEER & FORKS	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
Water Truck Civil Cre	Off-Highway Trucks	350	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	515	253	262
GRADER 150 AWD Ci	Graders	200	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
SKID STEER & FORKS	Forklifts (Heavy)	100	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
Mechanic Truck Civil	Off-Highway Trucks	335	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
FORKLIFT 12K Struct	Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	4	287	183	104
CRANE 275 TON Stru	Cranes (heavy)	500	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
EXCAVATOR>60,000	Excavators (medium)	175	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
FORKLIFT 12K Struct	Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
FORKLIFT 12K Struct	Forklifts	100	FORKLIFT 12K	Structure Installation - Monopole and Lattice - 4-Legged	1	287	183	104
CRANE 160 TON RT S	Cranes	500	CRANE 160 TON RT	Structure Installation - Monopole and Lattice - 4-Legged	1	287	183	104
FORKLIFT 12K Struct	Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Spotting	1	287	183	104
CRANE 100 TON RT S	Cranes (medium)	270	CRANE 100 TON RT	Structure Installation - Spotting	1	287	183	104
DOZER D8 TRIPLE BU	Rubber Tired Dozers (heavy)	350	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation	4	287	52	235
DOZER D6 SINGLE TC	Rubber Tired Dozers (medium)	200	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	2	287	52	235
HARDLINE PULLER C	Other Construction Equipment	500	HARDLINE PULLER	Conductor and Wires Installation	4	287	52	235
TRIPLE DRUM PULLER	Other Construction Equipment (medium)	175	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation	6	287	52	235
TENSIONER 72" BND	Other Construction Equipment	300	TENSIONER 72" BNDL TRK MNTD	Conductor and Wires Installation	2	287	52	235
FORKLIFT 12K Condu	Forklifts (Heavy)	100	FORKLIFT 12K	Conductor and Wires Installation	4	287	52	235
7 TON ARMY BUNK T	Off-Highway Trucks	400	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	4	287	52	235
BUCKET TRUCK 90'-1	Off-Highway Trucks	300	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	2	287	52	235
CRANE 40T Conduct	Cranes (heavy)	425	CRANE 40T	Conductor and Wires Installation	11	287	52	235
SKID STEER & FORKS	Forklifts (Heavy)	100	SKID STEER & FORKS	Conductor and Wires Installation	2	287	52	235
Mechanic Truck Con	Off-Highway Trucks	335	Mechanic Truck	Conductor and Wires Installation	2	287	52	235
EXCAVATOR>100,000	Excavators (heavy)	450	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	211	-	211

Offroad Construction Equipment Combustion Emissions Calculations - Annual

CalEEMod Name	HP	Load Factor	Specific Name	Phase	Total Equipment Count for All Crews	Hours Per Day	Total No. of Usage Days	No. of Usage Days - 2029	No. of Usage Days - 2030	2029 MT/Year			2030 MT/Year			
										CO2	CH4	N2O	CO2	CH4	N2O	
Forklifts (medium)	96	0.2	R/T Forklift	Staging Areas		4	8	100	100	0	32	0.00	0.00	-	-	-
Generator Sets	45	0.74	Generator	Staging Areas		1	8	100	100	0	15	0.00	0.00	-	-	-
Off-Highway Trucks	350	0.38	Water Truck	Staging Areas		1	8	100	100	0	57	0.00	0.00	-	-	-
Graders	200	0.41	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew		2	8	366	235	131	163	0.01	0.00	91	0.00	0.00
Rubber Tired Dozers (medium)	200	0.4	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew		2	8	366	235	131	159	0.01	0.00	89	0.00	0.00
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew		2	8	366	235	131	266	0.01	0.00	148	0.01	0.00
Rollers	150	0.38	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew		2	8	366	235	131	113	0.00	0.00	63	0.00	0.00
Excavators (heavy)	450	0.38	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew		1	8	366	235	131	170	0.01	0.00	95	0.00	0.00
Rubber Tired Dozers (medium)	200	0.4	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew		1	8	366	235	131	80	0.00	0.00	44	0.00	0.00
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew		1	8	366	235	131	133	0.01	0.00	74	0.00	0.00
Rollers	150	0.38	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew		1	8	366	235	131	57	0.00	0.00	32	0.00	0.00
Bore/Drill Rigs	500	0.5	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew		3	8	288	210	78	659	0.03	0.01	245	0.01	0.00
Bore/Drill Rigs	400	0.5	LoDril	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew		3	8	288	210	78	527	0.02	0.00	196	0.01	0.00
Tractors/Loaders/Backhoes	150	0.37	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew		6	8	288	210	78	295	0.01	0.00	110	0.00	0.00
Cranes (heavy)	425	0.29	CRANE 40T	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew		6	8	288	210	78	657	0.03	0.00	244	0.01	0.00
Other Material Handling Equipment	400	0.4	Material Handler	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew		3	8	288	210	78	427	0.02	0.00	158	0.01	0.00
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew		3	8	288	210	78	53	0.00	0.00	20	0.00	0.00
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)		3	8	515	253	262	429	0.02	0.00	444	0.02	0.00
Graders	200	0.41	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)		1	8	515	253	262	88	0.00	0.00	91	0.00	0.00
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)		1	8	515	253	262	21	0.00	0.00	22	0.00	0.00
Off-Highway Trucks	335	0.38	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)		1	8	515	253	262	137	0.01	0.00	142	0.01	0.00
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing		4	8	287	183	104	62	0.00	0.00	35	0.00	0.00
Cranes (heavy)	500	0.29	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting		4	8	287	183	104	449	0.02	0.00	255	0.01	0.00
Excavators (medium)	175	0.38	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting		4	8	287	183	104	206	0.01	0.00	117	0.00	0.00
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting		4	8	287	183	104	62	0.00	0.00	35	0.00	0.00
Forklifts	100	0.2	FORKLIFT 12K	Structure Installation - Monopole and Lattice - 4-Legged		1	9	287	183	104	17	0.00	0.00	10	0.00	0.00
Cranes	500	0.29	CRANE 160 TON RT	Structure Installation - Monopole and Lattice - 4-Legged		1	10	287	183	104	140	0.01	0.00	80	0.00	0.00
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Spotting		1	8	287	183	104	15	0.00	0.00	9	0.00	0.00
Cranes (medium)	270	0.29	CRANE 100 TON RT	Structure Installation - Spotting		1	8	287	183	104	61	0.00	0.00	34	0.00	0.00
Rubber Tired Dozers (heavy)	350	0.4	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation		4	8	287	52	235	124	0.01	0.00	561	0.02	0.00
Rubber Tired Dozers (medium)	200	0.4	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation		2	8	287	52	235	35	0.00	0.00	159	0.01	0.00
Other Construction Equipment	500	0.42	HARDLINE PULLER	Conductor and Wires Installation		4	8	287	52	235	186	0.01	0.00	839	0.03	0.01
Other Construction Equipment (medium)	175	0.42	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation		6	8	287	52	235	97	0.00	0.00	440	0.02	0.00
Other Construction Equipment	300	0.42	TENSIONER 72" BNDL TRK MNTD	Conductor and Wires Installation		2	8	287	52	235	56	0.00	0.00	252	0.01	0.00
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Conductor and Wires Installation		4	8	287	52	235	18	0.00	0.00	80	0.00	0.00
Off-Highway Trucks	400	0.38	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation		4	8	287	52	235	134	0.01	0.00	607	0.02	0.00
Off-Highway Trucks	300	0.38	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation		2	8	287	52	235	50	0.00	0.00	228	0.01	0.00
Cranes (heavy)	425	0.29	CRANE 40T	Conductor and Wires Installation		11	8	287	52	235	298	0.01	0.00	1,349	0.05	0.01
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Conductor and Wires Installation		2	8	287	52	235	9	0.00	0.00	40	0.00	0.00
Off-Highway Trucks	335	0.38	Mechanic Truck	Conductor and Wires Installation		2	8	287	52	235	56	0.00	0.00	254	0.01	0.00
Excavators (heavy)	450	0.38	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)		1	8	211	0	211	-	-	-	152	0.01	0.00

Offroad Construction Equipment Combustion Emissions - Annual

Construction Phase	2029 MT/Year			2030 MT/Year		
	CO2	CH4	N2O	CO2	CH4	N2O
Staging Areas	104	0.00	0.00	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	701	0.03	0.01	391	0.02	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	439	0.02	0.00	245	0.01	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2,619	0.10	0.02	973	0.04	0.01
Civil Crew (Road Maintenance, BMP's, Gates)	675	0.03	0.01	699	0.03	0.01
Structure Installation - Lattice - Guyed V Framing	62	0.00	0.00	35	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	717	0.03	0.01	408	0.02	0.00
Structure Installation - Monopole and Lattice - 4-Legged	158	0.01	0.00	90	0.00	0.00
Structure Installation - Spotting	76	0.00	0.00	43	0.00	0.00
Conductor and Wires Installation	1,064	0.04	0.01	4,807	0.19	0.04
Civil Crew (Clean Up)	-	-	-	152	0.01	0.00

Onroad Equipment Usage for All Crews

Primary Equipment Description	Phase	Total Equipment Count for All Crews	Fuel Type
1-Ton Truck, 4x4	Staging Areas	4	Diesel
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	3	Gas
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	2	Gas
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	12	Gas
Semi	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2	Diesel
PICKUP 3/4 TON	Civil Crew (Road Maintenance, BMP's, Gates)	2	Diesel
PICKUP 3/4 TON	Structure Installation - Lattice - Guyed V Framing	4	Diesel
PICKUP 1 TON DIESEL	Structure Installation - Lattice - Guyed V Framing	4	Diesel
PICKUP 3/4 TON	Structure Installation - Lattice - Guyed V Setting	4	Gas
PICKUP WINCH TRUCK	Structure Installation - Lattice - Guyed V Setting	8	Diesel
PICKUP 3/4 TON	Structure Installation - Monopole and Lattice - 4-Legged	9	Gas
PICKUP 1 TON DIESEL	Structure Installation - Monopole and Lattice - 4-Legged	3	Diesel
Semi	Structure Installation - Spotting	3	Diesel
PICKUP 1 TON DIESEL	Structure Installation - Spotting	1	Diesel
PICKUP 3/4 TON	Structure Installation - Spotting	1	Diesel
SEMI - ON ROAD	Conductor and Wires Installation	6	Diesel
SEMI - ON ROAD	Conductor and Wires Installation	6	Diesel
SEMI - ON/OFF ROAD 6X6	Conductor and Wires Installation	4	Diesel
PICKUP 1 TON DIESEL	Conductor and Wires Installation	4	Diesel
PICKUP 3/4 TON DIESEL	Conductor and Wires Installation	32	Gas
PICKUP WINCH TRUCK	Conductor and Wires Installation	20	Diesel
PICKUP 3/4 TON	Civil Crew (Clean Up)	2	Gas

Phase	Primary Equipment Description	EMFAC Classification	Fuel Type	Trips per Day
Staging Areas	1-Ton Truck, 4x4	HHDT	Diesel	8
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	Gas	6
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	Gas	4
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	Gas	24
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	Diesel	4
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	Diesel	4
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	Diesel	8
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	Diesel	8
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	Gas	8
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	Diesel	16
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	Gas	18
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	Diesel	6
Structure Installation - Spotting	Semi	HHDT	Diesel	6
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	Diesel	2
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	Diesel	2
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	12
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	12
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	Diesel	8
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	Diesel	8
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	Gas	64
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	Diesel	40
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	Gas	4
Staging Areas	Worker	LHDT2	Gas	12
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	Gas	8
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	Gas	10
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	Gas	14
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	Gas	20
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	Gas	6
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	Gas	10
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	Gas	8
Structure Installation - Spotting	Worker	LHDT2	Gas	10
Conductor and Wires Installation	Worker	LHDT2	Gas	11
Civil Crew (Clean Up)	Worker	LHDT2	Gas	20
Staging Areas	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	Diesel	7
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	Diesel	12
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	Diesel	12
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	Diesel	12
Structure Installation - Spotting	Hauling	HHDT	Diesel	12
Conductor and Wires Installation	Hauling	HHDT	Diesel	2
Civil Crew (Clean Up)	Hauling	HHDT	Diesel	2

Notes: 1,250 hauling trips were estimated assuming total material export is 20,000 CY and hauling truck capacity is 16 CY.

Phase	Estimated Workforce/Crew	Total Equipment Count for All Crews	Hauling Trips per Day	Estimated Workforce All
Staging Areas	6	4	1.00	6
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	8	3	1.00	4
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	5	2	1.00	5
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	21	14	1.00	7
Civil Crew (Road Maintenance, BMP's, Gates)	10	2	3.67	10
Structure Installation - Lattice - Guyed V Framing	12	8	6.00	3
Structure Installation - Lattice - Guyed V Setting	20	12	6.00	5
Structure Installation - Monopole and Lattice - 4-Legged	12	12	6.00	4
Structure Installation - Spotting	5	5	6.00	5
Conductor and Wires Installation	16	72	1.00	5
Civil Crew (Clean Up)	10	2	1.00	10

Mobile Combustion Annual Emissions - Paved Roadways

Phase	Primary Equipment Description	EMFAC Classification	Work Days			Fuel Type	Speed Bin (mph)	Trips Per Day	Paved Trip Length (miles)	Total Trip Length (mi)	Daily VMT (miles/day)	2029 Annual VMT (miles/year)	2030 Annual VMT (miles/year)	EMFAC Emission Factors (g/mile)			2029 MT/Year			2030 MT/Year		
			2029	2030										CO2	NH4	N2O	CO2	NH4	N2O	CO2	NH4	N2O
Staging Areas	1-Ton Truck, 4x4	HHDT	100	-	Diesel	Aggregate	8	10	20	80	8,000	-	-	537.30	0.00	0.38	4.31E+00	1.79E-05	3.02E-03	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	235	131	Gas	Aggregate	6	5	9	28	6,514	3,631	611.32	0.00	0.01	3.99E+00	2.68E-05	8.60E-05	2.22	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	235	131	Gas	Aggregate	4	5	9	18	4,343	2,421	611.32	0.00	0.01	2.66E+00	1.79E-05	5.73E-05	1.48	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	210	78	Gas	Aggregate	24	5	9	111	23,285	8,649	611.32	0.00	0.01	1.43E+01	9.57E-05	3.07E-04	5.30	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	210	78	Diesel	Aggregate	4	10	20	40	8,400	3,120	537.30	0.00	0.38	4.52E+00	1.88E-05	3.17E-03	1.68	0.00	0.00	
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	253	262	Diesel	Aggregate	4	5	9	18	4,675	4,842	537.30	0.00	0.38	2.52E+00	1.05E-05	1.76E-03	2.61	0.00	0.00	
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	183	104	Diesel	Aggregate	8	10	20	80	14,640	8,320	537.30	0.00	0.38	7.88E+00	3.28E-05	5.52E-03	4.48	0.00	0.00	
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	183	104	Diesel	Aggregate	8	5	9	37	6,764	3,844	611.32	0.00	0.01	4.14E+00	2.78E-05	8.93E-05	2.35	0.00	0.00	
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	183	104	Gas	Aggregate	8	5	9	37	6,764	3,844	611.32	0.00	0.01	4.14E+00	2.78E-05	8.93E-05	2.35	0.00	0.00	
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	183	104	Diesel	Aggregate	16	10	20	160	29,280	16,640	537.30	0.00	0.38	1.58E+01	6.57E-05	1.10E-02	8.96	0.00	0.01	
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	183	104	Gas	Aggregate	18	5	9	83	15,218	8,649	611.32	0.00	0.01	9.32E+00	6.26E-05	2.01E-04	5.30	0.00	0.00	
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	183	104	Diesel	Aggregate	6	10	20	60	10,980	6,240	537.30	0.00	0.38	5.91E+00	2.46E-05	4.14E-03	3.36	0.00	0.00	
Structure Installation - Spotting	Semi	HHDT	183	104	Diesel	Aggregate	6	10	20	60	10,980	6,240	537.30	0.00	0.38	5.91E+00	2.46E-05	4.14E-03	3.36	0.00	0.00	
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	183	104	Diesel	Aggregate	2	5	9	9	1,691	961	537.30	0.00	0.38	9.10E-01	3.79E-06	6.38E-04	0.52	0.00	0.00	
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	183	104	Diesel	Aggregate	2	5	9	9	1,691	961	537.30	0.00	0.38	9.10E-01	3.79E-06	6.38E-04	0.52	0.00	0.00	
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	Aggregate	12	10	20	120	6,240	28,200	537.30	0.00	0.38	3.36E+00	1.40E-05	2.35E-03	15.18	0.00	0.01	
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	Aggregate	12	10	20	120	6,240	28,200	537.30	0.00	0.38	3.36E+00	1.40E-05	2.35E-03	15.18	0.00	0.01	
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	52	235	Diesel	Aggregate	8	10	20	80	4,160	18,800	537.30	0.00	0.38	2.24E+00	9.33E-06	1.57E-03	10.12	0.00	0.01	
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	52	235	Diesel	Aggregate	8	5	9	37	1,922	8,686	537.30	0.00	0.38	1.03E+00	4.31E-06	7.25E-04	4.68	0.00	0.00	
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	52	235	Gas	Aggregate	64	5	9	296	15,375	69,485	611.32	0.00	0.01	9.42E+00	6.32E-05	2.03E-04	42.57	0.00	0.00	
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	52	235	Diesel	Aggregate	40	5	9	185	9,610	43,428	537.30	0.00	0.38	5.17E+00	2.16E-05	3.63E-03	23.38	0.00	0.02	
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	-	211	Gas	Aggregate	4	5	9	18	-	3,899	611.32	0.00	0.01	0.00E+00	0.00E+00	0.00E+00	2.39	0.00	0.00	
Staging Areas	Worker	LHDT2	100	-	Gas	Aggregate	12	5	9	55	5,544	-	611.32	0.00	0.01	3.40E+00	2.28E-05	7.32E-05	-	-	-	
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	235	131	Gas	Aggregate	8	5	9	37	8,686	4,842	611.32	0.00	0.01	5.32E+00	3.57E-05	1.15E-04	2.97	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	235	131	Gas	Aggregate	10	5	9	46	10,857	6,052	611.32	0.00	0.01	6.65E+00	4.46E-05	1.43E-04	3.71	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	210	78	Gas	Aggregate	14	5	9	65	13,583	5,045	611.32	0.00	0.01	8.32E+00	5.59E-05	1.79E-04	3.09	0.00	0.00	
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	253	262	Gas	Aggregate	20	5	9	92	23,377	24,209	611.32	0.00	0.01	1.43E+01	9.61E-05	3.09E-04	14.83	0.00	0.00	
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	183	104	Gas	Aggregate	6	5	9	28	5,073	2,883	611.32	0.00	0.01	3.11E+00	2.09E-05	6.70E-05	1.77	0.00	0.00	
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	183	104	Gas	Aggregate	10	5	9	46	8,455	4,805	611.32	0.00	0.01	5.18E+00	3.48E-05	1.12E-04	2.94	0.00	0.00	
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	183	104	Gas	Aggregate	8	5	9	37	6,764	3,844	611.32	0.00	0.01	4.14E+00	2.78E-05	8.93E-05	2.35	0.00	0.00	
Structure Installation - Spotting	Worker	LHDT2	183	104	Gas	Aggregate	10	5	9	46	8,455	4,805	611.32	0.00	0.01	5.18E+00	3.48E-05	1.12E-04	2.94	0.00	0.00	
Conductor and Wires Installation	Worker	LHDT2	52	235	Gas	Aggregate	11	5	9	49	2,563	11,581	611.32	0.00	0.01	1.57E+00	1.05E-05	3.38E-05	7.09	0.00	0.00	
Civil Crew (Clean Up)	Worker	LHDT2	-	211	Gas	Aggregate	20	5	9	92	-	19,496	611.32	0.00	0.01	0.00E+00	0.00E+00	0.00E+00	11.94	0.00	0.00	
Staging Areas	Hauling	HHDT	100	-	Diesel	Aggregate	2	10	20	20	2,000	-	537.30	0.00	0.38	1.08E+00	4.49E-06	7.54E-04	-	-	-	
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	235	131	Diesel	Aggregate	2	10	20	20	4,700	2,620	537.30	0.00	0.38	2.53E+00	1.05E-05	1.77E-03	1.41	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	235	131	Diesel	Aggregate	2	10	20	20	4,700	2,620	537.30	0.00	0.38	2.53E+00	1.05E-05	1.77E-03	1.41	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	210	78	Diesel	Aggregate	2	10	20	20	4,200	1,560	537.30	0.00	0.38	2.26E+00	9.42E-06	1.58E-03	0.84	0.00	0.00	
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	253	262	Diesel	Aggregate	7	10	20	73	18,570	19,230	537.30	0.00	0.38	1.00E+01	4.17E-05	7.01E-03	10.35	0.00	0.01	
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	183	104	Diesel	Aggregate	12	10	20	120	21,960	12,480	537.30	0.00	0.38	1.18E+01	4.93E-05	8.28E-03	6.72	0.00	0.00	
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	183	104	Diesel	Aggregate	12	10	20	120	21,960	12,480	537.30	0.00	0.38	1.18E+01	4.93E-05	8.28E-03	6.72	0.00	0.00	
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	183	104	Diesel	Aggregate	12	10	20	120	21,960	12,480	537.30	0.00	0.38	1.18E+01	4.93E-05	8.28E-03	6.72	0.00	0.00	
Structure Installation - Spotting	Hauling	HHDT	183	104	Diesel	Aggregate	12	10	20	120	21,960	12,480	537.30	0.00	0.38	1.18E+01	4.93E-05	8.28E-03	6.72	0.00	0.00	
Conductor and Wires Installation	Hauling	HHDT	52	235	Diesel	Aggregate	2	10	20	20	1,040	4,700	537.30	0.00	0.38	5.60E-01	2.33E-06	3.92E-04	2.53	0.00	0.00	
Civil Crew (Clean Up)	Hauling	HHDT	-	211	Diesel	Aggregate	2	10	20	20	-	4,220	537.30	0.00	0.38	0.00E+00	0.00E+00	0.00E+00	2.27	0.00	0.00	

Notes:
1. Assumed CalEEMod default values for Imperial County for trip length. It was assumed that 60% of total trips would be on paved roads.
2. Hauling trips during the "Civil Crew (Road Work, Foundations, Ducts)" were based on 20,000 CY of material export and 16 CY per haul truck.
3. EMFAC 2021 emissions factors for 2029 were used for each year of construction. Aggregate speed assumed. Fuel type was provided to Rincon.
4. Emissions assume a 55% reduction in PM10, as watering twice a day for industrial unpaved roads is 55%. Additional measures that will further reduce PM10 include limiting the max speed to 25 mph (44% reduction) and applying chemical dust suppressants annually to unpaved parking areas (84% reduction).

2029 Annual VMT (miles/year)	2030 Annual VMT (miles/year)
413,176	451,490

% of roads paved	50%
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Construction Phase	CO2	NH4	N2O	CO2	NH4	N2O
Staging Areas	8.78E+00	4.52E-05	3.85E-03	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1.18E+01	7.30E-05	1.97E-03	6.60	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1.18E+01	7.30E-05	1.97E-03	6.60	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2.94E+01	1.80E-04	5.24E-03	10.91	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	2.68E+01	1.48E-04	9.08E-03	27.79	0.00	0.01
Structure Installation - Lattice - Guyed V Framing	2.70E+01	1.31E-04	1.40E-02	15.32	0.00	0.01
Structure Installation - Lattice - Guyed V Setting	3.69E+01	1.78E-04	1.95E-02	20.98	0.00	0.01
Structure Installation - Monopole and Lattice - 4-Legged	3.12E+01	1.64E-04	1.27E-02	17.73	0.00	0.01
Structure Installation - Spotting	2.47E+01	1.16E-04	1.38E-02	14.06	0.00	0.01
Conductor and Wires Installation	2.67E+01	1.39E-04	1.13E-02	120.74	0.00	0.05
Civil Crew (Clean Up)	0.00E+00	0.00E+00	0.00E+00	16.60	0.00	0.00

Mobile Combustion Annual Emissions - Unpaved Roadways

Phase	Primary Equipment Description	EMFAC Classification	Work Days			Fuel Type	Speed Bin (mph)	Trips Per Day	Trip Length (miles)	Daily VMT (miles/day)	2029 Annual VMT (miles/year)	2030 Annual VMT (miles/year)	Emission Factors (g/mile)			2029 MT/Year			2030 MT/Year		
			2029	2030									CO2	NH4	N2O	CO2	NH4	N2O	CO2	NH4	N2O
Staging Areas	1-Ton Truck, 4x4	HHDT	100	-	Diesel	15	8	10	80	8,000	-	-	1,892.88	0.00	0.40	15.17	0.00	0.00	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	235	131	Gas	25	6	5	28	6,514	3,631	858.53	0.01	0.01	5.60	0.00	0.00	3.12	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	235	131	Gas	25	4	5	18	4,343	2,421	858.53	0.01	0.01	3.74	0.00	0.00	2.08	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	210	78	Gas	25	24	5	111	23,285	8,649	858.53	0.01	0.01	20.03	0.00	0.00	7.44	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	210	78	Diesel	15	4	10	40	8,400	3,120	1,892.88	0.00	0.40	15.93	0.00	0.00	5.92	0.00	0.00	
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	253	262	Diesel	25	4	5	18	4,675	4,842	735.52	0.01	0.38	3.45	0.00	0.00	3.57	0.00	0.00	
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	183	104	Diesel	25	8	10	80	14,640	8,320	735.52	0.01	0.38	10.79	0.00	0.01	6.13	0.00	0.00	
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	183	104	Diesel	25	8	5	37	6,764	3,844	858.53	0.01	0.01	5.82	0.00	0.00	3.31	0.00	0.00	
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	183	104	Gas	25	8	5	37	6,764	3,844	858.53	0.01	0.01	5.82	0.00	0.00	3.31	0.00	0.00	
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	183	104	Diesel	25	16	10	160	29,280	16,640	735.52	0.01	0.38	21.58	0.00	0.01	12.26	0.00	0.01	
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	183	104	Gas	25	18	5	83	15,218	8,649	858.53	0.01	0.01	13.09	0.00	0.00	7.44	0.00	0.00	
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	183	104	Diesel	15	6	10	60	10,980	6,240	735.52	0.01	0.38	8.09	0.00	0.00	4.60	0.00	0.00	
Structure Installation - Spotting	Semi	HHDT	183	104	Semi	15	6	10	60	10,980	6,240	735.52	0.01	0.38	8.09	0.00	0.00	4.60	0.00	0.00	
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	183	104	Diesel	25	2	5	9	1,691	961	735.52	0.01	0.38	1.25	0.00	0.00	0.71	0.00	0.00	
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	183	104	Diesel	25	2	5	9	1,691	961	735.52	0.01	0.38	1.25	0.00	0.00	0.71	0.00	0.00	
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	15	12	10	120	6,240	28,200	1,892.88	0.00	0.40	11.84	0.00	0.00	53.49	0.00	0.01	
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	15	12	10	120	6,240	28,200	1,892.88	0.00	0.40	11.84	0.00	0.00	53.49	0.00	0.01	
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	52	235	Diesel	15	8	10	80	4,160	18,800	1,892.88	0.00	0.40	7.89	0.00	0.00	35.66	0.00	0.01	
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	52	235	Diesel	25	8	5	37	1,922	8,686	735.52	0.01	0.38	1.42	0.00	0.00	6.40	0.00	0.00	
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	52	235	Gas	25	64	5	296	15,375	69,485	858.53	0.01	0.01	13.23	0.00	0.00	59.78	0.00	0.00	
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	52	235	Diesel	25	40	5	185	9,610	43,428	735.52	0.01	0.38	7.08	0.00	0.00	32.01	0.00	0.02	
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	-	211	Gas	25	4	5	18	-	3,899	858.53	0.01	0.01	-	-	-	3.35	0.00	0.00	
Staging Areas	Worker	LHDT2	100	-	Gas	25	12	5	55	5,544	-	858.53	0.01	0.01	4.77	0.00	0.00	-	-	-	
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	235	131	Gas	25	8	5	37	8,686	4,842	858.53	0.01	0.01	7.47	0.00	0.00	4.17	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	235	131	Gas	25	10	5	46	10,857	6,052	858.53	0.01	0.01	9.34	0.00	0.00	5.21	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	210	78	Gas	25	14	5	65	13,583	5,045	858.53	0.01	0.01	11.69	0.00	0.00	4.34	0.00	0.00	
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	253	262	Gas	25	20	5	92	23,377	24,209	858.53	0.01	0.01	20.11	0.00	0.00	20.83	0.00	0.00	
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	183	104	Gas	25	6	5	28	5,073	2,883	858.53	0.01	0.01	4.36	0.00	0.00	2.48	0.00	0.00	
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	183	104	Gas	25	10	5	46	8,455	4,805	858.53	0.01	0.01	7.27	0.00	0.00	4.13	0.00	0.00	
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	183	104	Gas	25	8	5	37	6,764	3,844	858.53	0.01	0.01	5.82	0.00	0.00	3.31	0.00	0.00	
Structure Installation - Spotting	Worker	LHDT2	183	104	Gas	25	10	5	46	8,455	4,805	858.53	0.01	0.01	7.27	0.00	0.00	4.13	0.00	0.00	
Conductor and Wires Installation	Worker	LHDT2	52	235	Gas	25	11	5	49	2,563	11,581	858.53	0.01	0.01	2.20	0.00	0.00	9.96	0.00	0.00	
Civil Crew (Clean Up)	Worker	LHDT2	-	211	Gas	25	20	5	92	-	19,496	858.53	0.01	0.01	-	-	-	16.77	0.00	0.00	
Staging Areas	Hauling	HHDT	100	-	Diesel	15	2	10	20	2,000	-	1,892.88	0.00	0.40	3.79	0.00	0.00	-	-	-	
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	235	131	Diesel	15	2	10	20	4,700	2,620	1,892.88	0.00	0.40	8.92	0.00	0.00	4.97	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	235	131	Diesel	15	2	10	20	4,700	2,620	1,892.88	0.00	0.40	8.92	0.00	0.00	4.97	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	210	78	Diesel	15	2	10	20	4,200	1,560	1,892.88	0.00	0.40	7.97	0.00	0.00	2.96	0.00	0.00	
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	253	262	Diesel	15	7	10	73	18,570	19,230	1,892.88	0.00	0.40	35.22	0.00	0.01	36.48	0.00	0.01	
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	183	104	Diesel	15	12	10	120	21,960	12,480	1,892.88	0.00	0.40	41.66	0.00	0.01	23.67	0.00	0.00	
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	183	104	Diesel	15	12	10	120	21,960	12,480	1,892.88	0.00	0.40	41.66	0.00	0.01	23.67	0.00	0.00	
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	183	104	Diesel	15	12	10	120	21,960	12,480	1,892.88	0.00	0.40	41.66	0.00	0.01	23.67	0.00	0.00	
Structure Installation - Spotting	Hauling	HHDT	183	104	Diesel	15	12	10	120	21,960	12,480	1,892.88	0.00	0.40	41.66	0.00	0.01	23.67	0.00	0.00	
Conductor and Wires Installation	Hauling	HHDT	52	235	Diesel	15	2	10	20	1,040	4,700	1,892.88	0.00	0.40	1.97	0.00	0.00	8.92	0.00	0.00	
Civil Crew (Clean Up)	Hauling	HHDT	-	211	Diesel	15	2	10	20	-	4,220	1,892.88	0.00	0.40	-	-	-	8.00	0.00	0.00	

Notes:
 1. It was assumed that 40% of total trips would be on unpaved roads.
 2. Hauling trips during the "Civic Crew (Road Work, Foundations, Ducts)" were based on 20,000 CY of material export and 16 CY per haul truck.
 3. EMFAC 2021 emissions factors for 2029 were used for each year of construction. 25 mph speed was assumed for worker trips, while 15 mph speed assumed for hauling trips. Fuel type was provided to Rincon.
 4. Emissions assume a 55% reduction in PM10, as watering twice a day for industrial unpaved roads is 55%. Additional measures that will further reduce PM10 include limiting the max speed to 25 mph (44% reduction) and applying chemical dust suppressants annually to unpaved parking areas (84% reduction).

% of roadways unpaved 50%
 % of roadways unpaved 50%

Construction Phase	2029 MT/Year			2030 MT/Year		
	CO2	NH4	N2O	CO2	NH4	N2O
Staging Areas	23.74	0.00	0.00	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Cr	21.99	0.00	0.00	12.26	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Cre	21.99	0.00	0.00	12.26	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation	55.62	0.00	0.01	20.66	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	58.78	0.00	0.01	60.87	0.00	0.01
Structure Installation - Lattice - Guyed V Framing	62.63	0.00	0.01	35.59	0.00	0.01
Structure Installation - Lattice - Guyed V Setting	76.33	0.00	0.02	43.38	0.00	0.01
Structure Installation - Monopole and Lattice - 4-Legged	68.66	0.00	0.01	39.02	0.00	0.01
Structure Installation - Spotting	59.51	0.00	0.01	33.82	0.00	0.01
Conductor and Wires Installation	57.47	0.00	0.01	259.71	0.00	0.05
Civil Crew (Clean Up)	-	-	-	28.13	0.00	0.00

Helicopter Type and Usage

Type	Engine	HP	Fuel Consumption (gallons/hr)
UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	GECT7-2A	4380	133
Bell 407/MD530F (Light Duty)	Alison 250-C20B	420	28

Source: Fuel Consumption is obtained from the U.S. Department of Interior National Business Center (2006)

Helicopter Emission Factors

Helicopter Emission Factor Type	HC	lbs/hr	NOx	CO	SOx	PM10	CO2	lbs/gallon
UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)		0.13	10.49	2.02	0.65	0.72	18.355	
Bell 407/MD530F (Light Duty)		0.08	1.75	2.07	0.14	0.1	18.355	

Source: Emission factors for HC, NOx, CO, and SOx were obtained from the California Public Utilities Commission (2007); PM10 emission factors were obtained from the CPUC (2006); and CO2 emission factor for aviation gasoline was obtained from the U.S. Department of Energy (2008).

Note: Emission factors for Sikorsky UH-60A Blackhawk/Boeing CH-47D Chinook were derived from the emission factors for H-53 Super Stallion (T64-GE-416 Turboshaft 4,380 hp engine). Emission factors for take-off and climb-out modes were used. Emission factors for Bell 407/MD530F were derived from the emission factors for Bell 206 Jet Ranger (Alison 250-C20 Turboshaft 420 hp engine). Emission factors for take-off mode were used.

Helicopter Usage Schedule

Phase	Type	Hours per Day	Number of Helicopters	Total Days of Helicopter Usage	No of Days 2029	No of Days 2030
Staging Areas	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	100	-
Staging Areas	Bell 407/MD530F (Light Duty)	-	-	-	100	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Bell 407/MD530F (Light Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Bell 407/MD530F (Light Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	210	78
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bell 407/MD530F (Light Duty)	-	-	-	210	78
Civil Crew (Road Maintenance, BMP's, Gates)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	253	262
Civil Crew (Road Maintenance, BMP's, Gates)	Bell 407/MD530F (Light Duty)	-	-	-	253	262
Structure Installation - Lattice - Guyed V Framing	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	6	1	287	183	104
Structure Installation - Lattice - Guyed V Framing	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Lattice - Guyed V Setting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Lattice - Guyed V Setting	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Monopole and Lattice - 4-Legged	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Monopole and Lattice - 4-Legged	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Spotting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Spotting	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Conductor and Wires Installation	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	52	235
Conductor and Wires Installation	Bell 407/MD530F (Light Duty)	5	2	235	52	235
Civil Crew (Clean Up)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	211
Civil Crew (Clean Up)	Bell 407/MD530F (Light Duty)	-	-	-	-	211

Helicopter Emissions - Annual

Helicopter Emissions		lbs per day						2029 Emissions (TPY)						2030 Emissions (TPY)						2030 MT/Year			
Phase	Type	ROG	NOx	CO	SO2	PM10	PM2.5	ROG	NOx	CO	SO2	PM10E	PM2.5E	ROG	NOx	CO	SO2	PM10E	PM2.5E	CO2	CH4	N2O	
Staging Areas	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Staging Areas	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	0.78	62.94	12.12	3.90	4.32	-	0.07	5.76	1.11	0.36	0.40	-	0.04	3.27	0.63	0.20	0.22	-	761.66	-	-	
Structure Installation - Lattice - Guyed V Framing	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Spotting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Spotting	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductor and Wires Installation	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductor and Wires Installation	Bell 407/MD530F (Light Duty)	1.30	17.50	20.70	1.40	1.00	-	0.03	0.46	0.54	0.04	0.03	-	0.15	2.06	2.43	0.16	0.12	-	603.88	-	-	
Civil Crew (Clean Up)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Clean Up)	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Energy Calculations

Ironwood Transmission Line Project

****The Proposed Project plans to develop an 86 mile transmission line from California to Arizona. 80 miles (93 percent) of construction occurring in California and 6 miles (7 percent) of transmission line construction occurring in Arizona.**

Overall Project Energy Use During Construction

Electricity

	Water Consumption	8,888.95 kWh
Total kWh		8,889 kWh

Gasoline

On Road	27,243 Gallons
Off Road	n/a Gallons

Diesel

On Road	80,675 Gallons
Off Road	1,348,461 Gallons

Jet A

Helicopter	311,024 Gallons
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Total Gasoline	27,243 Gallons
Total Diesel	1,429,135 Gallons
Jet A	311,024 Gallons

Ironwood Transmission Line Project

California Project Energy Use During Construction

Electricity

	Water Consumption	8,266.72 kWh
Total kWh		8,267 kWh

Gasoline

On Road	25,336 Gallons
Off Road	n/a Gallons

Diesel

On Road	75,027 Gallons
Off Road	1,254,068 Gallons

Jet A

Helicopter	289,252 Gallons
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Total Gasoline

25,336 Gallons

Total Diesel

1,329,096 Gallons

Jet A

289,252 Gallons

,1

Ironwood Transmission Line Project

Arizona Project Energy Use During Construction

Electricity

Water Cons	622.23 kWh
Total kWh	622 kWh

Gasoline

On Road	1,907 Gallons
Off Road	n/a Gallons

Diesel

On Road	5,647 Gallons
Off Road	94,392 Gallons

Jet A

Helicopter	21,772 Gallons
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Total Gasoline	1,907 Gallons
Total Diesel	100,039 Gallons
Jet A	21,772 Gallons

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) [1]: 0.05
Gallons/HP

Estimated Off-Road Construction Equipment Diesel Fuel Consumption

General Name	HP	Specific Name	Phase	No. of Equipment	Hours per Day	Load Factor	Total No. of Usage Days	Fuel Used (gallons)
Forklifts	96	R/T Forklift	Staging Areas	4	8	0.2	101	3,103
Generator Sets	45	Generator	Staging Areas	1	8	0.74	101	1,345
Off-Highway Trucks	350	Water Truck	Staging Areas	1	8	0.38	101	5,373
Graders	200	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land	2	8	0.41	366	24,010
Rubber Tired Dozers	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land	2	8	0.4	366	23,424
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land	2	8	0.38	366	38,942
Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land	2	8	0.38	366	16,690
Excavators	450	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular	1	8	0.38	366	25,034
Rubber Tired Dozers	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular	1	8	0.4	366	11,712
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular	1	8	0.38	366	19,471
Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular	1	8	0.38	366	8,345
Bore/Drill Rigs	500	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundat	3	8	0.5	287	86,100
Bore/Drill Rigs	400	LoDrill	Civil Crew (Road Work, Foundations, Ducts) - Foundat	3	8	0.5	287	68,880
Tractors/Loaders/Backhoes	150	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundat	6	8	0.37	287	38,228
Cranes	425	CRANE 40T	Crew (Road Work, Foundations, Ducts) - Foundation C	6	8	0.29	287	84,895
Other Material Handling Equipment	400	Material Handler	Crew (Road Work, Foundations, Ducts) - Foundation C	3	8	0.4	287	55,104
Forklifts	100	SKID STEER & FORKS	Crew (Road Work, Foundations, Ducts) - Foundation C	3	8	0.2	287	6,888
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	8	0.38	514	82,034
Graders	200	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	0.41	514	16,859
Forklifts	100	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	0.2	514	4,112
Off-Highway Trucks	335	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	0.38	514	26,173
Forklifts	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	4	8	0.2	288	9,216
Cranes	500	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	4	8	0.29	288	66,816
Excavators	175	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting	4	8	0.38	288	30,643
Forklifts	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	4	8	0.2	288	9,216
Forklifts	100	FORKLIFT 12K	Structure Installation - Spotting	1	8	0.2	288	2,304
Cranes	270	CRANE 100 TON RT	Structure Installation - Spotting	1	8	0.29	288	9,020
Rubber Tired Dozers	350	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation	4	8	0.4	290	64,960
Rubber Tired Dozers	200	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	2	8	0.4	290	18,560
Other Construction Equipment	500	HARDLINE PULLER	Conductor and Wires Installation	4	8	0.42	290	97,440
Other Construction Equipment	175	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation	6	8	0.42	290	51,156
Other Construction Equipment	300	TENSIONER 72" BN DL TRK MNTD	Conductor and Wires Installation	2	8	0.42	290	29,232
Forklifts	100	FORKLIFT 12K	Conductor and Wires Installation	4	8	0.2	290	9,280
Off-Highway Trucks	400	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	4	8	0.38	290	70,528
Off-Highway Trucks	300	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	2	8	0.38	290	26,448
Cranes	425	CRANE 40T	Conductor and Wires Installation	11	8	0.29	290	157,267
Forklifts	100	SKID STEER & FORKS	Conductor and Wires Installation	2	8	0.2	290	4,640
Off-Highway Trucks	335	Mechanic Truck	Conductor and Wires Installation	2	8	0.38	290	29,534
Excavators	450	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	8	0.38	210	14,364
Crushing & Processing Equipment	85		Blasting	3	8	0.78	14	1,114

TABLE A9 - 3 - E
FUEL USAGE ESTIMATES PER HORSEPOWER-HOUR
(Estimated Horsepower x Estimated Hours of Usage = Brake Horsepower-Hour)
(For Example, 500 Brake Horsepower x 8 Hours Used = 4,000 Brake Horsepower-Hours)

Fuel Type	Fuel Usage/Horsepower-hour
Diesel	0.05 Gallons
Gasoline	0.12 Gallons
Fuel Oil	0.05 Gallons
Methanol	0.12 Gallons
LPG, Propane, Butane	0.07 Gallons
Natural Gas	7.5 Cubic Feet

77.9688

[1] SCAQMD 1993 CEQA Air Quality Handbook Table 9A-3E

Total Fuel Used 1,348,461
Gallons

Estimated Off-Road Helicopter Diesel Fuel Consumption

Phase	Helicopter Type and Usage		Total Days	# of Helicopters	Fuel Consumption (gallons/hr)	Fuel Consumption Total
	Type	Hours per Day				
Structure Installation	UH-60A Blackhawk/CH-47	6	288	1	133	229,824
Structure Installation		-	-			
Conductor and Wires Installation		-	-			
Conductor and Wires Installation	Bell 407/MD530F (Light Du	5	290	2	28	81,200
Total Fuel Used					311,024	

Gallons

Source: Fuel Consumption is obtained from the U.S. Department of Interior National Business Center (2006)

Ironwood Transmission Line Project

Water Usage for Control of Fugitive Dust during Construction

Phase	Days	# of Equipment	Average Daily Acreage Disturbed	Total Gallons	Electricity (kWhr)
Stagline Area	101	1	0.5	152,510.0	351.38
Civil Crew (Road Work, Foundations, Ducts)	366	2	1	1,105,320.0	2,546.66
Civil Crew (Road Maintenance, BMP's, Gates)	287	6	3	2,600,220.0	5,990.91
			Total	3,858,050.0	8,888.95

Gallons per year of water usage for dust control is calculated based on a minimum control efficiency of 66% (three times daily) with an application rate of 3,020 gal/acre/day (Air & Waste Management Association Air Pollution Engineering Manual (1992 Edition))

CalEEMod Default: Each gallon of delivered potable water in Colorado River Region is associated with

kwh/gallon

0.002304

Table G-32. Water Energy Intensity Factors by Hydrologic Region and Process (kWh per million gallon)

Hydrologic Region	Supply	Treat	Distribute	Wastewater
South Coast	3044	725	1537	1501
San Francisco Bay	1182	754	2998	1542
Central Coast	1577	754	1537	1542
Tulare Lake	1506	748	166	1519
North Coast	620	754	1537	1542
San Joaquin River	827	748	166	1519
Colorado River	2304	748	166	1519
Sacramento River	698	748	166	1519
South Lahontan	1953	748	1537	1519
North Lahontan	541	748	166	1519

Source: Sziniari, G.; Abraham, S.; Cooley, H.; Gleick, P. 2021. The Future of California's Water-Energy-Climate Nexus. Prepared by the Pacific Institute. Produced by Next 10. Available: https://www.next10.org/sites/default/files/2021-09/Next10-Water-Energy-Report_v2.pdf.

Accessed: March 2022

Estimated On-Road Construction Equipment Diesel Fuel Consumption

Phase	Primary Equipment Description	EMFAC Classification	Work Days			Fuel Type	Daily VMT	Miles per Gallon	Fuel Used (gallons)	Light Duty MPG	HHDT MPG
			2029	2030	2031		(miles/day)	Total	Total		
Staging Areas	1-Ton Truck, 4x4	HHDT	101	0	0	Diesel	160	22.8	3,648	22.8	7.8
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	131	235	0	Gas	55	7.8	432		
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	131	235	0	Gas	37	7.8	288		
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	104	183	0	Gas	222	7.8	1,730		
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	104	183	0	Diesel	80	22.8	1,824		
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	149	313	52	Diesel	37	22.8	843		
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	79	209	0	Diesel	160	22.8	3,648		
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	79	209	0	Diesel	74	22.8	1,685		
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	79	209	0	Gas	74	7.8	577		
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	79	209	0	Diesel	320	22.8	7,296		
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	79	209	0	Gas	166	7.8	1,297		
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	79	209	0	Diesel	120	22.8	2,736		
Structure Installation - Spotting	Semi	HHDT	79	209	0	Diesel	120	22.8	2,736		
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	79	209	0	Diesel	18	22.8	421		
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	79	209	0	Diesel	18	22.8	421		
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	0	262	28	Diesel	240	22.8	5,472		
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	0	262	28	Diesel	240	22.8	5,472		
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	0	262	28	Diesel	160	22.8	3,648		
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	0	262	28	Diesel	74	22.8	1,685		
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	0	262	28	Gas	591	7.8	4,613		
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	0	262	28	Diesel	370	22.8	8,427		
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	0	158	52	Gas	37	7.8	288		
Staging Areas	Worker	LHDT2	101	0	0	Gas	111	7.8	865		
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	131	235	0	Gas	148	7.8	1,153		
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	131	235	0	Gas	92	7.8	721		
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	104	183	0	Gas	388	7.8	3,027		
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	149	313	52	Gas	185	7.8	1,441		
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	79	209	0	Gas	222	7.8	1,730		
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	79	209	0	Gas	370	7.8	2,883		
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	79	209	0	Gas	222	7.8	1,730		
Structure Installation - Spotting	Worker	LHDT2	79	209	0	Gas	92	7.8	721		
Conductor and Wires Installation	Worker	LHDT2	0	262	28	Gas	296	7.8	2,306		
Civil Crew (Clean Up)	Worker	LHDT2	0	158	52	Gas	185	7.8	1,441		
Staging Areas	Hauling	HHDT	101	0	0	Diesel	40	22.8	912		
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	131	235	0	Diesel	40	22.8	912		
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	131	235	0	Diesel	40	22.8	912		
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	104	183	0	Diesel	40	22.8	912		
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	149	313	52	Diesel	147	22.8	3,352		
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	79	209	0	Diesel	240	22.8	5,472		
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	79	209	0	Diesel	240	22.8	5,472		
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	79	209	0	Diesel	240	22.8	5,472		
Structure Installation - Spotting	Hauling	HHDT	79	209	0	Diesel	240	22.8	5,472		
Conductor and Wires Installation	Hauling	HHDT	0	262	28	Diesel	40	22.8	912		
Civil Crew (Clean Up)	Hauling	HHDT	0	158	52	Diesel	40	22.8	912		

Total Gasoline Consumption (gallons)	27,243
Total Diesel Consumption (gallons)	80,675