

Appendix C: Air Quality Modeling

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\MBA\Desktop\Grasslands\Grasslands Site Construction.urb924

Project Name: Grasslands Site

Project Location: Yolo County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2013 TOTALS (tons/year unmitigated)	0.03	0.23	0.14	0.00	0.83	0.02	0.84	0.17	0.01	0.19	27.63

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
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2013	0.03	0.23	0.14	0.00	0.83	0.02	0.84	0.17	0.01	0.19	27.63
Fine Grading 03/01/2013-03/11/2013	0.01	0.07	0.04	0.00	0.83	0.00	0.83	0.17	0.00	0.18	9.05
Fine Grading Dust	0.00	0.00	0.00	0.00	0.83	0.00	0.83	0.17	0.00	0.17	0.00
Fine Grading Off Road Diesel	0.01	0.07	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.70
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
Trenching 03/12/2013-03/22/2013	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.85
Trenching Off Road Diesel	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.62
Trenching Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
Building 03/23/2013-05/07/2013	0.02	0.15	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	16.74
Building Off Road Diesel	0.02	0.15	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	16.74
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

- Phase: Fine Grading 3/1/2013 - 3/11/2013 - Fine Site Grading
- Total Acres Disturbed: 30
- Maximum Daily Acreage Disturbed: 7.5
- Fugitive Dust Level of Detail: Default
- 20 lbs per acre-day
- On Road Truck Travel (VMT): 0
- Off-Road Equipment:
- 1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day
- 0.5 Other Equipment (327 hp) operating at a 0.62 load factor for 6 hours per day
- 0.5 Rough Terrain Forklifts (83 hp) operating at a 0.6 load factor for 8 hours per day
- 0.5 Water Trucks (381 hp) operating at a 0.57 load factor for 4 hours per day

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Phase: Trenching 3/12/2013 - 3/22/2013 - Trenching onsite and or offsite

Off-Road Equipment:

0.5 Rubber Tired Loaders (87 hp) operating at a 0.54 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (75 hp) operating at a 0.55 load factor for 6 hours per day

0.1 Trenchers (69 hp) operating at a 0.75 load factor for 6 hours per day

Phase: Building Construction 3/23/2013 - 5/7/2013 - PV Installation

Off-Road Equipment:

0.8 Cranes (208 hp) operating at a 0.43 load factor for 6 hours per day

0.8 Forklifts (149 hp) operating at a 0.3 load factor for 6 hours per day

0.8 Other General Industrial Equipment (82 hp) operating at a 0.75 load factor for 4 hours per day

1.7 Tractors/Loaders/Backhoes (75 hp) operating at a 0.55 load factor for 6 hours per day

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\MBA\Desktop\Grasslands\Grasslands Site Construction.urb924

Project Name: Grasslands Site

Project Location: Yolo County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2013 TOTALS (lbs/day unmitigated)	1.53	12.19	7.13	0.00	150.00	0.64	150.64	31.33	0.58	31.91	1,645.25
2013 TOTALS (lbs/day mitigated)	1.53	12.19	7.13	0.00	39.61	0.64	40.24	8.27	0.58	8.86	1,645.25

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
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Time Slice 3/1/2013-3/11/2013 Active Days: 11	<u>1.53</u>	<u>12.19</u>	<u>7.13</u>	<u>0.00</u>	<u>150.00</u>	<u>0.64</u>	<u>150.64</u>	<u>31.33</u>	<u>0.58</u>	<u>31.91</u>	<u>1,645.25</u>
Fine Grading 03/01/2013-03/11/2013	1.53	12.19	7.13	0.00	150.00	0.64	150.64	31.33	0.58	31.91	1,645.25
Fine Grading Dust	0.00	0.00	0.00	0.00	150.00	0.00	150.00	31.33	0.00	31.33	0.00
Fine Grading Off Road Diesel	1.51	12.16	6.59	0.00	0.00	0.63	0.63	0.00	0.58	0.58	1,581.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.02	0.03	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.92
Time Slice 3/12/2013-3/22/2013 Active Days: 11	0.46	2.85	2.38	0.00	0.00	0.24	0.24	0.00	0.22	0.22	335.99
Trenching 03/12/2013-03/22/2013	0.46	2.85	2.38	0.00	0.00	0.24	0.24	0.00	0.22	0.22	335.99
Trenching Off Road Diesel	0.44	2.83	2.04	0.00	0.00	0.24	0.24	0.00	0.22	0.22	295.08
Trenching Worker Trips	0.01	0.02	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.91
Time Slice 3/23/2013-5/7/2013 Active Days: 46	0.92	6.58	3.96	0.00	0.00	0.45	0.45	0.00	0.42	0.42	727.62
Building 03/23/2013-05/07/2013	0.92	6.58	3.96	0.00	0.00	0.45	0.45	0.00	0.42	0.42	727.62
Building Off Road Diesel	0.92	6.58	3.96	0.00	0.00	0.45	0.45	0.00	0.42	0.42	727.62
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Fine Grading 3/1/2013 - 3/11/2013 - Fine Site Grading
 Total Acres Disturbed: 30
 Maximum Daily Acreage Disturbed: 7.5
 Fugitive Dust Level of Detail: Default
 20 lbs per acre-day
 On Road Truck Travel (VMT): 0
 Off-Road Equipment:
 1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

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- 0.5 Other Equipment (327 hp) operating at a 0.62 load factor for 6 hours per day
- 0.5 Rough Terrain Forklifts (83 hp) operating at a 0.6 load factor for 8 hours per day
- 0.5 Water Trucks (381 hp) operating at a 0.57 load factor for 4 hours per day

Phase: Trenching 3/12/2013 - 3/22/2013 - Trenching onsite and or offsite

Off-Road Equipment:

- 0.5 Rubber Tired Loaders (87 hp) operating at a 0.54 load factor for 6 hours per day
- 1 Tractors/Loaders/Backhoes (75 hp) operating at a 0.55 load factor for 6 hours per day
- 0.1 Trenchers (69 hp) operating at a 0.75 load factor for 6 hours per day

Phase: Building Construction 3/23/2013 - 5/7/2013 - PV Installation

Off-Road Equipment:

- 0.8 Cranes (208 hp) operating at a 0.43 load factor for 6 hours per day
- 0.8 Forklifts (149 hp) operating at a 0.3 load factor for 6 hours per day
- 0.8 Other General Industrial Equipment (82 hp) operating at a 0.75 load factor for 4 hours per day
- 1.7 Tractors/Loaders/Backhoes (75 hp) operating at a 0.55 load factor for 6 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
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Time Slice 3/1/2013-3/11/2013 Active Days: 11	<u>1.53</u>	<u>12.19</u>	<u>7.13</u>	<u>0.00</u>	<u>39.61</u>	<u>0.64</u>	<u>40.24</u>	<u>8.27</u>	<u>0.58</u>	<u>8.86</u>	<u>1,645.25</u>
Fine Grading 03/01/2013-03/11/2013	1.53	12.19	7.13	0.00	39.61	0.64	40.24	8.27	0.58	8.86	1,645.25
Fine Grading Dust	0.00	0.00	0.00	0.00	39.61	0.00	39.61	8.27	0.00	8.27	0.00
Fine Grading Off Road Diesel	1.51	12.16	6.59	0.00	0.00	0.63	0.63	0.00	0.58	0.58	1,581.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.02	0.03	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.92
Time Slice 3/12/2013-3/22/2013 Active Days: 11	0.46	2.85	2.38	0.00	0.00	0.24	0.24	0.00	0.22	0.22	335.99
Trenching 03/12/2013-03/22/2013	0.46	2.85	2.38	0.00	0.00	0.24	0.24	0.00	0.22	0.22	335.99
Trenching Off Road Diesel	0.44	2.83	2.04	0.00	0.00	0.24	0.24	0.00	0.22	0.22	295.08
Trenching Worker Trips	0.01	0.02	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.91
Time Slice 3/23/2013-5/7/2013 Active Days: 46	0.92	6.58	3.96	0.00	0.00	0.45	0.45	0.00	0.42	0.42	727.62
Building 03/23/2013-05/07/2013	0.92	6.58	3.96	0.00	0.00	0.45	0.45	0.00	0.42	0.42	727.62
Building Off Road Diesel	0.92	6.58	3.96	0.00	0.00	0.45	0.45	0.00	0.42	0.42	727.62
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 3/1/2013 - 3/11/2013 - Fine Site Grading

For Soil Stabilizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stabilizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stabilizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\MBA\Desktop\Grasslands\Beamer Site Construction.urb924

Project Name: Beamer Cottonwood Site

Project Location: Yolo County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2013 TOTALS (tons/year unmitigated)	0.01	0.07	0.05	0.00	0.06	0.00	0.06	0.01	0.00	0.02	8.51

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
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2013	0.01	0.07	0.05	0.00	0.06	0.00	0.06	0.01	0.00	0.02	8.51
Fine Grading 03/01/2013-03/11/2013	0.01	0.04	0.03	0.00	0.06	0.00	0.06	0.01	0.00	0.01	4.78
Fine Grading Dust	0.00	0.00	0.00	0.00	0.06	0.00	0.06	0.01	0.00	0.01	0.00
Fine Grading Off Road Diesel	0.01	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.59
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
Trenching 03/12/2013-03/22/2013	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45
Trenching Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Building 03/23/2013-05/07/2013	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.22
Building Off Road Diesel	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.22
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

- Phase: Fine Grading 3/1/2013 - 3/11/2013 - Fine Site Grading
- Total Acres Disturbed: 2
- Maximum Daily Acreage Disturbed: 0.5
- Fugitive Dust Level of Detail: Default
- 20 lbs per acre-day
- On Road Truck Travel (VMT): 0
- Off-Road Equipment:
- 1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day
- 0.1 Other Equipment (327 hp) operating at a 0.62 load factor for 6 hours per day
- 0.1 Rough Terrain Forklifts (83 hp) operating at a 0.6 load factor for 8 hours per day
- 0.1 Water Trucks (381 hp) operating at a 0.57 load factor for 4 hours per day

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Phase: Trenching 3/12/2013 - 3/22/2013 - Trenching onsite and or offsite

Off-Road Equipment:

0.1 Rubber Tired Loaders (87 hp) operating at a 0.54 load factor for 6 hours per day

0.2 Tractors/Loaders/Backhoes (75 hp) operating at a 0.55 load factor for 6 hours per day

0.1 Trenchers (69 hp) operating at a 0.75 load factor for 6 hours per day

Phase: Building Construction 3/23/2013 - 5/7/2013 - PV Installation

Off-Road Equipment:

0.1 Cranes (208 hp) operating at a 0.43 load factor for 6 hours per day

0.1 Forklifts (149 hp) operating at a 0.3 load factor for 6 hours per day

0.1 Other General Industrial Equipment (82 hp) operating at a 0.75 load factor for 4 hours per day

0.5 Tractors/Loaders/Backhoes (75 hp) operating at a 0.55 load factor for 6 hours per day

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Time Slice 3/12/2013-3/22/2013 Active Days: 11	0.14	0.85	0.66	0.00	0.00	0.07	0.07	0.00	0.07	0.07	92.59
Trenching 03/12/2013-03/22/2013	0.14	0.85	0.66	0.00	0.00	0.07	0.07	0.00	0.07	0.07	92.59
Trenching Off Road Diesel	0.13	0.85	0.58	0.00	0.00	0.07	0.07	0.00	0.07	0.07	82.36
Trenching Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.23
Time Slice 3/23/2013-5/7/2013 Active Days: 46	0.18	1.26	0.83	0.00	0.00	0.09	0.09	0.00	0.09	0.09	139.99
Building 03/23/2013-05/07/2013	0.18	1.26	0.83	0.00	0.00	0.09	0.09	0.00	0.09	0.09	139.99
Building Off Road Diesel	0.18	1.26	0.83	0.00	0.00	0.09	0.09	0.00	0.09	0.09	139.99
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Fine Grading 3/1/2013 - 3/11/2013 - Fine Site Grading

Total Acres Disturbed: 2

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

0.1 Other Equipment (327 hp) operating at a 0.62 load factor for 6 hours per day

0.1 Rough Terrain Forklifts (83 hp) operating at a 0.6 load factor for 8 hours per day

0.1 Water Trucks (381 hp) operating at a 0.57 load factor for 4 hours per day

Phase: Trenching 3/12/2013 - 3/22/2013 - Trenching onsite and or offsite

Off-Road Equipment:

0.1 Rubber Tired Loaders (87 hp) operating at a 0.54 load factor for 6 hours per day

0.2 Tractors/Loaders/Backhoes (75 hp) operating at a 0.55 load factor for 6 hours per day

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0.1 Trenchers (69 hp) operating at a 0.75 load factor for 6 hours per day

Phase: Building Construction 3/23/2013 - 5/7/2013 - PV Installation

Off-Road Equipment:

0.1 Cranes (208 hp) operating at a 0.43 load factor for 6 hours per day

0.1 Forklifts (149 hp) operating at a 0.3 load factor for 6 hours per day

0.1 Other General Industrial Equipment (82 hp) operating at a 0.75 load factor for 4 hours per day

0.5 Tractors/Loaders/Backhoes (75 hp) operating at a 0.55 load factor for 6 hours per day