Appendix B

Near-Field Modeling Analysis AERMOD Parameters

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Table B.1
Pinedale Anticline Near-Field Modeling
PM_{10} Source Emissions and Modeling Parameters

PM_{10} Sources	Modeled Emission Rate	Modeled Area Source	Modeled Emission Rate	Modeled Emission Rate	Source Type	Source Layout	Area Source Release Height	Area Source X_{int}	Area Source Y_{int}	Volume Source Release Height	Volume Source s y_{int}	Volume Source s z_{int}
	(lb/hr)	(m^2)	($g/s/m^2$)	(g/s)			(m)	(m)	(m)	(m)	(m)	(m)
Well Pad Construction	0.750			0.095	Volume	16 volume sources representing the well pad area. Information given for one volume source.				5	33.1	4.65
Road Construction	0.338			0.052	Volume	13 volume sources representing the newly constructed road (~3/16 mile). Information given for one volume source.				5	9.3	4.65
Well Pad Construction Traffic	0.053			0.007	Volume	Heavy equipment exhaust added in volume source representing the well pad area.				5	33.1	4.65
Road Construction Traffic	0.065			0.008	Volume	Heavy equipment exhaust added in volume source representing the newly constructed road.				5	9.3	4.65
Well Pad Wind Erosion	7.560	80980	1.18E-05		Area	Area source centered around the well pad.	0	284.57	284.57			
Access Road Wind Erosion	1.580	2600	7.66E-05		Area	Area source covering the newly constructed road.	0	260	10			

Table B.2
Pinedale Anticline Near-Field Modeling
$PM_{2.5}$ Source Emissions and Modeling Parameters

$PM_{2.5}$ Sources	Modeled Emission Rate	Modeled Area Source	Modeled Emission Rate	Modeled Emission Rate	Source Type	Source Layout	Area Source Release Height	Area Source X_{int}	Area Source Y_{int}	Volume Source Release Height	Volume Source s y_{int}	Volume Source s z_{int}
	(lb/hr)	(m^2)	($g/s/m^2$)	(g/s)			(m)	(m)	(m)	(m)	(m)	(m)
Well Pad Construction	0.198			0.095	Volume	16 volume sources representing the well pad area. Information given for one volume source.				5	33.1	4.65
Road Construction	0.089			0.052	Volume	13 volume sources representing the newly constructed road (~3/16 mile). Information given for one volume source.				5	9.3	4.65
Well Pad Construction Traffic	0.053			0.007	Volume	Heavy equipment exhaust added in volume source representing the well pad area.				5	33.1	4.65
Road Construction Traffic	0.065			0.008	Volume	Heavy equipment exhaust added in volume source representing the newly constructed road.				5	9.3	4.65
Well Pad Wind Erosion	3.020	80980	4.70E-06		Area	Area source centered around the well pad.	0	284.57	284.57			
Access Road Wind Erosion	0.630	2600	3.05E-05		Area	Area source covering the newly constructed road.	0	260	10			

Table B.3
Pinedale Anticline Near-Field Modeling
Drill Rig and Modeling Parameters

SO_2 Sources	Modeled Emission Rate	Modeled Emission Rate	Source Type	Source Layout	Stack Height	Stack Temperature	Stack Velocity	Stack Diameter
	(lb/hr)	(g/s)			(m)	(K)	(m/s)	(m)
Drilling Rig (stack 1)	0.157	0.020	Point	Three stacks per drill rig centered on pad. See additional comment.	6.1	675	30	0.2
Drilling Rig (stack 2)	0.157	0.020	Point		6.1	700	25	0.2
Drilling Rig (stack 3)	0.157	0.020	Point		6.1	725	20	0.2

All three stack parameter scenarios are for each drill rig.
There are a total of four drill rigs per section for tier 1and 2 (12 stacks) and two drill rigs for tier 0 analysis (6 stacks).

Table B.4
Pinedale Anticline Near-Field Modeling
Compression Modeling Summary

			Source Location UTM Zone 13		Stack Parameters					Modeled Emissions		
Facility	Stack ID	Source Type	Easting	Northing	Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)	Stack Parameter and Emissions Source	NOx (g/s)	CO (g/s)	Formaldehyde (g/s)
Paradise C.S.	PE1	Point	597497.0	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE2	Point	597505.9	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE3	Point	597515.0	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE4	Point	597524.2	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE5	Point	597533.3	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE6	Point	597542.5	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE7	Point	597551.0	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE8	Point	597560.0	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE9	Point	597569.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE10	Point	597578.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE11	Point	597587.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE12	Point	597596.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE13	Point	597605.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE14	Point	597614.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE15	Point	597623.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE16	Point	597632.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE17	Point	597641.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE18	Point	597650.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE19	Point	597659.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE20	Point	597668.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE21	Point	597677.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PG1	Point	597575.2	4726393.7	12.80	808.00	21.67	0.50	Paradise Permit Application	0.500	0.129	0.035
Paradise C.S.	PG2	Point	597581.3	4726393.7	12.80	808.00	21.67	0.50	Paradise Permit Application	0.500	0.129	0.035
Paradise C.S.	PVRU	Point	597593.4	4726491.5	9.10	832.00	16.70	0.20	Paradise Permit Application	0.070	0.014	0.005
Paradise C.S.	PH1	Point	597567.6		5.50	561.00	2.09	0.61	Paradise Permit Application	0.050	0.041	0.001
Paradise C.S.	PEF1	Point	597623.4	4726526.5	11.00	1273.00	0.27	2.18	Paradise Permit Application	0.070	0.140	0.000
Paradise C.S.	PT1	Point	597497.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT2	Point	597505.9	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT3	Point	597515.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT4	Point	597524.2	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT5	Point	597533.3	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT6	Point	597542.5	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT7	Point	597551.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT8	Point	597560.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT9	Point	597569.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT10	Point	597578.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT11	Point	597587.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT12	Point	597596.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT13	Point	597605.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Pinedale C.S.	QPE1	Point	597642.9	4727057.5	15.24	721.3	30	0.51	Pinedale Permit Application	0.363	0.156	0.0250
Pinedale C.S.	QPE2	Point	597647.6	4727050.0	15.24	721.3	30	0.51	Pinedale Permit Application	0.363	0.156	0.0250
Pinedale C.S.	QPE3a	Point	597666.9	4727027.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.155	0.0315
Pinedale C.S.	QPE3b	Point	597612.1	4727125.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.155	0.0315
Pinedale C.S.	QPE4a	Point	597672.0	4727018.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.155	0.0315

Table B.4
Pinedale Anticline Near-Field Modeling
Compression Modeling Summary

			Source Location UTM Zone 13		Stack Parameters					Modeled Emissions		
Facility	Stack ID	Source Type	Easting	Northing	Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)	Stack Parameter and Emissions Source	NOx (g/s)	CO (g/s)	Formaldehyde (g/s)
Pinedale C.S.	QPE4b	Point	597673.3	4727016.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.155	0.0315
Pinedale C.S.	QPE5a	Point	597604.9	4727138.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.129	0.0315
Pinedale C.S.	QPE5b	Point	597606.1	4727136.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.129	0.0315
Pinedale C.S.	QPE6a	Point	597610.8	4727127.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.129	0.0315
Pinedale C.S.	QPE6b	Point	597612.1	4727125.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.129	0.0315
Pinedale C.S.	QPT1	Point	597606.1	4727160.0	15.24	802.00	33.49	1.22	Pinedale Permit Application	0.861	0.861	0.0600
Pinedale C.S.	QPT2	Point	597610.8	4727160.0	15.24	802.00	33.49	1.22	Pinedale Permit Application	0.861	0.861	0.0600
Pinedale C.S.	QPT3	Point	597612.1	4727160.0	15.24	802.00	33.49	1.22	Pinedale Permit Application	0.861	0.861	0.0600
Falcon C.S.	FE1	Point	608976.3	4708663.6	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FE2	Point	608970.4	4708656.6	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FE3	Point	608964.5	4708649.6	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FE4	Point	608958.6	4708642.6	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FE5	Point	608942.8	4708635.7	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FE6	Point	608936.8	4708711.0	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FG5	Point	608991.8	4708715.0	7.62	808.00	21.67	0.50	Falcon Permit Application	0.505	0.129	0.035
Falcon C.S.	FG6	Point	608987.0	4708715.0	7.62	808.00	21.67	0.50	Falcon Permit Application	0.505	0.129	0.035
Falcon C.S.	FVRU	Point	608938.7	4708621.9	6.10	832.00	16.70	0.20	Falcon Permit Application	0.068	0.014	0.005
Falcon C.S.	FH1	Point	608903.0	4708636.7	4.60	561.00	2.10	0.61	Falcon Permit Application	0.048	0.040	0.000
Falcon C.S.	FH2	Point	608908.4	4708656.9	5.50	561.00	0.60	0.30	Falcon Permit Application	0.003	0.003	0.000
Falcon C.S.	FCU1	Point	608874.6	4708632.9	10.97	1273.00	0.44	1.22	Falcon Permit Application	0.038	0.210	0.000
Falcon C.S.	FEF1	Point	608858.8	4708624.0	10.97	1273.00	0.27	2.18	Falcon Permit Application	0.065	0.129	0.000
Falcon C.S.	FE7	Point	608976.3	4708589.0	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FE8	Point	608970.4	4708589.0	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FT1	Point	608964.5	4708589.0	14.80	802.00	33.49	1.22	Falcon Permit Application	1.110	1.389	0.003
Falcon C.S.	FT2	Point	608958.6	4708589.0	14.80	802.00	33.49	1.22	Falcon Permit Application	1.110	1.389	0.003
Falcon C.S.	FT3	Point	608942.8	4708589.0	14.80	802.00	33.49	1.22	Falcon Permit Application	1.110	1.389	0.003
Bird Canyon C.S.	BE1	Point	580414.5	4681474.3	14.80	738.70	37.18	0.50	Bird Canyon Permit Application	0.480	0.172	0.048
Bird Canyon C.S.	BE2	Point	580419.2	4681481.2	14.80	738.70	37.18	0.50	Bird Canyon Permit Application	0.480	0.172	0.048
Bird Canyon C.S.	BE3	Point	580424.9	4681486.6	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE4	Point	580487.1	4681544.9	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE5	Point	580493.6	4681550.9	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE6	Point	580500.6	4681556.6	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE7	Point	580469.3	4681387.4	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE8	Point	580475.7	4681393.4	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE9	Point	580482.2	4681399.4	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE10	Point	580488.7	4681405.4	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE11	Point	580494.9	4681411.4	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BG5	Point	580460.7	4681460.0	14.80	808.00	21.67	0.50	Bird Canyon Permit Application	0.500	0.129	0.035
Bird Canyon C.S.	BG6	Point	580464.8	4681463.8	14.80	808.00	21.67	0.50	Bird Canyon Permit Application	0.500	0.129	0.035
Bird Canyon C.S.	BCU1	Point	580505.4	4681605.7	11.00	637.00	0.44	1.22	Bird Canyon Permit Application	0.080	0.378	0.000
Bird Canyon C.S.	BH1	Point	580462.3	4681523.4	3.70	561.00	2.96	0.10	Bird Canyon Permit Application	0.002	0.002	0.000
Bird Canyon C.S.	BE12	Point	580414.5	4681352.4	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE13	Point	580419.2	4681358.4	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081

Table B.5
Pinedale Anticline Near-Field Modeling
HAPS Source Emissions and Modeling Parameters

HAP Pollutants	Modeled Emission Rate	Modeled Emission Rate	Source Type	Source Layout	Release Height	Volume Source s y_{int}	Volume Source s z_{int}
	(lb/hr)	(g/s)			(m)	(m)	(m)
Benzene	0.661	0.083	Volume	Each pollutant was modeled using 4 volume sources (1 in each quarter section - 1 section modeled). Each volume source represents a well pad with 32 wells (128 total). Includes gas dehydration emissions and condensate storage tank emissions.	5.0	11.63	4.65
Toluene	1.281	0.161	Volume		5.0	11.63	4.65
Ethylbenzene	0.079	0.010	Volume		5.0	11.63	4.65
Xylene	0.976	0.123	Volume		5.0	11.63	4.65
n-Hexane	0.423	0.053	Volume		5.0	11.63	4.65
Formaldehyde	See Table B.4 (Compressors)						