Snowstorm Exploration LLC
Snowstorm Exploration Project
Humboldt County, Nevada

Project Emissions Summary												
	PM_{10}		$PM_{2.5}$		SO_2		NOx		CO		VOC	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Process	0.39	0.52	0.39	0.52	0.36	0.48	5.43	7.27	1.17	1.57	0.39	0.53
Fugitives	19.89	8.16	5.65	2.07	0.04	0.04	26.99	25.24	23.90	22.97	1.41	1.33
Total	**20.27**	**8.68**	**6.03**	**2.59**	**0.40**	**0.52**	**32.41**	**32.51**	**25.06**	**24.54**	**1.80**	**1.86**

Cumulative Emissions Summary						
	PM_{10}	$PM_{2.5}$	SO_2	NOx	CO	VOC
	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr
Facilities	2,109.79	2,109.79	7,173.53	14,336.50	73,302.75	505.87
Vehicles	13.64	14.08	0.33	335.44	21,094.95	16.39
Total	**2,123.43**	**2,123.87**	**7,173.87**	**14,671.94**	**94,397.70**	**522.26**
Project contribution to Cumulative	**0.41%**	**0.12%**	**0.01%**	**0.22%**	**0.03%**	**0.35%**

Hazardous Air Pollutants (HAPs)

Pollutants	Emissions ton/yr
Benzene	0.0045
Toluene	0.0017
Xylenes	0.0012
Formaldehyde	0.0013
Actealdehyde	0.0007
Acrolein	0.0001
Naphthalene	0.0007
Total	**0.01**

Green House Gases (GHGs)

Pollutants	Emissions	
	lb/yr	ton/yr
CO_2	9,607,412	4,804
CH_4	1,158	1
N_2O	0	0
Fluorinated Gases	0	0
Total Annual GHG	**9,608,570**	**4,804**
Total CO_2 equivalent (metric tons)		**4,358**

Snowstorm Exploration LLC
Snowstorm Exploration Project
Humboldt County, Nevada

Air Pollution Emission Inventory
Master List of All Sources and Pollutants

Emission Unit Description	Pollutants
Mobile Machinery Sources	
Motor Grader	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2
Tracked Excavator	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2
4x4 Backhoe	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2
Dozer D-7 or D-8 equivalent	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2
Drill Rigs	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2
Low Impact Tractor	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2
3,500 gallon Water Trucks	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2
10-yard Dump Trucks	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2
Pipe Trucks	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2
Booster Trucks	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2
Service Trucks	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2
Light Pick-up Trucks	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2
Generators and other Combustion Sources	
Generator #1	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2, CH_4
Generator #2	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2, CH_4
Generator #3	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2, CH_4
Generator #4	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2, CH_4
Auxillary Air Compressor	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2, CH_4
Light Plant #1	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2, CH_4
Light Plant #2	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2, CH_4
Light Plant #3	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2, CH_4
Light Plant #4	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, VOCs, CO_2, CH_4

Snowstorm Exploration LLC			
Snowstorm Exploration Project			
Project Information and Assumptions			
Factor	**Value**	**Units**	**Source**
Silt content of road surface material (s) - Project Roads	8.00	%	Snowstorm
Surface material moisture content (M) - Project Roads	2.0	%	Snowstorm
Vehicle Speed in Project Area	15	mph	Snowstorm
Sulfur Content of fuel Burned (S) - Diesel	0.0015	%	EPA Limits S content to 15 ppm starting (7/2010)
Diesel Fuel Heating Value	137,000	Btu/gal	AP-42, Appendix A
Brake-Specific Fuel Value	7,000	Btu/hp-hr	Ap-42 default for diesel engines
Diesel Fuel Density	7.09	lbs/gal	
Emission Unit Specific Information			
Mobile Machinery Sources			
Motor Grader			
Availability of Individual Units	90%		Snowstorm
Utilization of Individual Units	80%		Snowstorm
Maximum Daily Hours of Operation	10	hours/day	Snowstorm
Actual Daily Hours of Operation	7	hours/day	Calc. - % availability * %utilization * max. hours
Annual Hours of Operation	100	hours/year	Snowstorm
Hourly Fuel Consumption	8	gal/hour	Snowstorm
Annual Fuel Consumption	800	gal/year	Calc. - hours/year * gal/hour
Horsepower	130	hp	Snowstorm
No. Units	1	Unit	Snowstorm
Tracked Excavator			
Availability of Individual Units	90%		Snowstorm
Utilization of Individual Units	80%		Snowstorm
Maximum Daily Hours of Operation	10	hours/day	Snowstorm
Actual Daily Hours of Operation	7	hours/day	Calc. - % availability * %utilization * max. hours
Annual Hours of Operation	50	hours/year	Snowstorm
Hourly Fuel Consumption	8	gal/hour	Snowstorm
Annual Fuel Consumption	400	gal/year	Calc. - hours/year * gal/hour
Horsepower	150	hp	Snowstorm
No. Units	2	Unit	Snowstorm
4x4 Backhoe			
Availability of Individual Units	90%		Snowstorm
Utilization of Individual Units	80%		Snowstorm
Maximum Daily Hours of Operation	6	hours/day	Snowstorm
Actual Daily Hours of Operation	4	hours/day	Calc. - % availability * %utilization * max. hours
Annual Hours of Operation	300	hours/year	Snowstorm
Hourly Fuel Consumption	6	gal/hour	Snowstorm
Annual Fuel Consumption	1,800	gal/year	Calc. - hours/year * gal/hour
Horsepower	90	hp	Snowstorm
No. Units	1	Unit	Snowstorm
Dozer D-7 or D-8 equivalent			
Availability of Individual Units	90%		Snowstorm
Utilization of Individual Units	80%		Snowstorm
Maximum Daily Hours of Operation	10	hours/day	Snowstorm
Actual Daily Hours of Operation	7	hours/day	Calc. - % availability * %utilization * max. hours
Annual Hours of Operation	50	hours/year	Snowstorm
Hourly Fuel Consumption	10	gal/hour	Snowstorm
Annual Fuel Consumption	500	gal/year	Calc. - hours/year * gal/hour
Horsepower	330	hp	Snowstorm
No. Units	1	Unit	Snowstorm
Drill Rigs			
Availability of Individual Units	90%		Snowstorm
Utilization of Individual Units	90%		Snowstorm
Maximum Daily Hours of Operation	22	hours/day	Snowstorm
Actual Daily Hours of Operation	18	hours/day	Calc. - % availability * %utilization * max. hours
Annual Hours of Operation	5,940	hours/year	Snowstorm
Hourly Fuel Consumption	10	gal/hour	Snowstorm
Annual Fuel Consumption	59,400	gal/year	Calc. - hours/year * gal/hour
Horsepower	350	hp	Snowstorm
No. Units	4	Unit	Snowstorm

Low Impact Tractor			
Availability of Individual Units	90%		Snowstorm
Utilization of Individual Units	80%		Snowstorm
Maximum Daily Hours of Operation	6	hours/day	Snowstorm
Actual Daily Hours of Operation	4	hours/day	Calc. - % availability * %utilization * max. hours
Annual Hours of Operation	100	hours/year	Snowstorm
Hourly Fuel Consumption	1	gal/hour	Snowstorm
Annual Fuel Consumption	100	gal/year	Calc. - hours/year * gal/hour
Horsepower	10	hp	Snowstorm
No. Units	1	Unit	Snowstorm
3,500 gallon Water Trucks			
Availability of Individual Units	90%		Snowstorm
Utilization of Individual Units	80%		Snowstorm
Maximum Daily Hours of Operation	10	hours/day	Snowstorm
Actual Daily Hours of Operation	7	hours/day	Calc. - % availability * %utilization * max. hours
Annual Hours of Operation	2,700	hours/year	Snowstorm
Hourly Fuel Consumption	8	gal/hour	Snowstorm
Annual Fuel Consumption	21,600	gal/year	Calc. - hours/year * gal/hour
Horsepower	350	hp	Snowstorm
No. Units	5	Unit	Snowstorm
10-yard Dump Trucks			
Availability of Individual Units	90%		Snowstorm
Utilization of Individual Units	80%		Snowstorm
Maximum Daily Hours of Operation	6	hours/day	Snowstorm
Actual Daily Hours of Operation	4	hours/day	Calc. - % availability * %utilization * max. hours
Annual Hours of Operation	200	hours/year	Snowstorm
Hourly Fuel Consumption	10	gal/hour	Snowstorm
Annual Fuel Consumption	2,000	gal/year	Calc. - hours/year * gal/hour
Horsepower	425	hp	Snowstorm
No. Units	1	Unit	Snowstorm
Pipe Trucks			
Availability of Individual Units	90%		Snowstorm
Utilization of Individual Units	80%		Snowstorm
Maximum Daily Hours of Operation	6	hours/day	Snowstorm
Actual Daily Hours of Operation	4	hours/day	Calc. - % availability * %utilization * max. hours
Annual Hours of Operation	600	hours/year	Snowstorm
Hourly Fuel Consumption	8	gal/hour	Snowstorm
Annual Fuel Consumption	4,800	gal/year	Calc. - hours/year * gal/hour
Horsepower	350	hp	Snowstorm
No. Units	4	Unit	Snowstorm
Booster Trucks			
Availability of Individual Units	90%		Snowstorm
Utilization of Individual Units	80%		Snowstorm
Maximum Daily Hours of Operation	22	hours/day	Snowstorm
Actual Daily Hours of Operation	16	hours/day	Calc. - % availability * %utilization * max. hours
Annual Hours of Operation	440	hours/year	Snowstorm
Hourly Fuel Consumption	8	gal/hour	Snowstorm
Annual Fuel Consumption	3,520	gal/year	Calc. - hours/year * gal/hour
Horsepower	350	hp	Snowstorm
No. Units	1	Unit	Snowstorm
Service Trucks			
Availability of Individual Units	90%		Snowstorm
Utilization of Individual Units	80%		Snowstorm
Maximum Daily Hours of Operation	10	hours/day	Snowstorm
Actual Daily Hours of Operation	7	hours/day	Calc. - % availability * %utilization * max. hours
Annual Hours of Operation	150	hours/year	Snowstorm
Hourly Fuel Consumption	8	gal/hour	Snowstorm
Annual Fuel Consumption	1,200	gal/year	Calc. - hours/year * gal/hour
Horsepower	350	hp	Snowstorm
No. Units	1	Unit	Snowstorm
Light Pick-up Trucks			
Availability of Individual Units	90%		Snowstorm
Utilization of Individual Units	80%		Snowstorm
Maximum Daily Hours of Operation	6	hours/day	Snowstorm
Actual Daily Hours of Operation	4	hours/day	Calc. - % availability * %utilization * max. hours
Annual Hours of Operation	1,620	hours/year	Snowstorm
Hourly Fuel Consumption	4	gal/hour	Snowstorm
Annual Fuel Consumption	6,480	gal/year	Calc. - hours/year * gal/hour
Horsepower	250	hp	Snowstorm
No. Units	5	Unit	Snowstorm

Generators and other Combustion Sources			
Generator #1			
Annual Hours of Operation	3,240	hours/year	Snowstorm
Hourly Fuel Consumption	1	gal/hour	Snowstorm
Annual Fuel Consumption	3,240	gal/year	Calc. - hours/year * gal/hour
Horsepower	20	hp	Snowstorm
No. Units	1	Unit	Snowstorm
Generator #2			
Annual Hours of Operation	3,240	hours/year	Snowstorm
Hourly Fuel Consumption	1	gal/hour	Snowstorm
Annual Fuel Consumption	3,240	gal/year	Calc. - hours/year * gal/hour
Horsepower	20	hp	Snowstorm
No. Units	1	Unit	Snowstorm
Generator #3			
Annual Hours of Operation	3,240	hours/year	Snowstorm
Hourly Fuel Consumption	1	gal/hour	Snowstorm
Annual Fuel Consumption	3,240	gal/year	Calc. - hours/year * gal/hour
Horsepower	20	hp	Snowstorm
No. Units	1	Unit	Snowstorm
Generator #4			
Annual Hours of Operation	3,240	hours/year	Snowstorm
Hourly Fuel Consumption	1	gal/hour	Snowstorm
Annual Fuel Consumption	3,240	gal/year	Calc. - hours/year * gal/hour
Horsepower	20	hp	Snowstorm
No. Units	1	Unit	Snowstorm
Auxillary Air Compressor			
Annual Hours of Operation	440	hours/year	Snowstorm
Hourly Fuel Consumption	4	gal/hour	Snowstorm
Annual Fuel Consumption	1,760	gal/year	Calc. - hours/year * gal/hour
Horsepower	35	hp	Snowstorm
No. Units	1	Unit	Snowstorm
Light Plant #1			
Annual Hours of Operation	3,240	hours/year	Snowstorm
Hourly Fuel Consumption	1	gal/hour	Snowstorm
Annual Fuel Consumption	3,240	gal/year	Calc. - hours/year * gal/hour
Horsepower	15	hp	Snowstorm
No. Units	1	Unit	Snowstorm
Light Plant #2			
Annual Hours of Operation	3,240	hours/year	Snowstorm
Hourly Fuel Consumption	1	gal/hour	Snowstorm
Annual Fuel Consumption	3,240	gal/year	Calc. - hours/year * gal/hour
Horsepower	15	hp	Snowstorm
No. Units	1	Unit	Snowstorm
Light Plant #3			
Annual Hours of Operation	3,240	hours/year	Snowstorm
Hourly Fuel Consumption	1	gal/hour	Snowstorm
Annual Fuel Consumption	3,240	gal/year	Calc. - hours/year * gal/hour
Horsepower	15	hp	Snowstorm
No. Units	1	Unit	Snowstorm
Light Plant #4			
Annual Hours of Operation	3,240	hours/year	Snowstorm
Hourly Fuel Consumption	1	gal/hour	Snowstorm
Annual Fuel Consumption	3,240	gal/year	Calc. - hours/year * gal/hour
Horsepower	15	hp	Snowstorm
No. Units	1	Unit	Snowstorm

Mobile Machinery Sources

Emission Factors Source: ARB and EPA Nonroad Engine Emission limits

Emission Unit	*Rating (hp)*	*Emission Factors (g/hp-hr)*				
		PM	**SO_2**	**NOx**	**CO**	**VOC**
Motor Grader	130	0.22	0.005	4.56	3.70	0.23
Tracked Excavator	150	0.22	0.005	4.56	3.70	0.23
4x4 Backhoe	90	0.22	0.005	5.32	3.70	0.28
Dozer D-7 or D-8 equivalent	330	0.15	0.005	2.85	2.60	0.15
Drill Rigs	350	0.15	0.005	2.85	2.60	0.15
Low Impact Tractor	10	0.75	0.005	5.32	6.00	0.28
3,500 gallon Water Trucks	350	0.15	0.005	2.85	2.60	0.15
10-yard Dump Trucks	425	0.15	0.005	2.85	2.60	0.15
Pipe Trucks	350	0.15	0.005	2.85	2.60	0.15
Booster Trucks	350	0.15	0.005	2.85	2.60	0.15
Service Trucks	350	0.15	0.005	2.85	2.60	0.15
Light Pick-up Trucks	250	0.15	0.005	2.85	2.60	0.15

Emission Unit	*Operational Hours (hr/yr)*	*Fuel Usage (gal/hr)*	*Number of Units*	**Fuel Based Output (hp-hr/yr)**
Motor Grader	100	8	1	15,657
Tracked Excavator	50	8	2	15,657
4x4 Backhoe	300	6	1	35,229
Dozer D-7 or D-8 equivalent	50	10	1	9,786
Drill Rigs	5,940	10	4	4,650,171
Low Impact Tractor	100	1	1	1,957
3,500 gallon Water Trucks	2,700	8	5	2,113,714
10-yard Dump Trucks	200	10	1	39,143
Pipe Trucks	600	8	4	375,771
Booster Trucks	440	8	1	68,891
Service Trucks	150	8	1	23,486
Light Pick-up Trucks	1,620	4	5	634,114

Emission Unit	*Emissions*									
	PM		**SO_2**		**NOx**		**CO**		**VOC**	
	lb/hr	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**
Motor Grader	0.076	0.004	0.002	0.000	1.574	0.079	1.277	0.064	0.079	0.004
Tracked Excavator	0.152	0.004	0.003	0.000	3.148	0.079	2.554	0.064	0.157	0.004
4x4 Backhoe	0.057	0.009	0.001	0.000	1.377	0.207	0.958	0.144	0.072	0.011
Dozer D-7 or D-8 equivalent	0.065	0.002	0.002	0.000	1.230	0.031	1.122	0.028	0.065	0.002
Drill Rigs	0.259	0.769	0.009	0.025	4.919	14.609	4.487	13.328	0.259	0.769
Low Impact Tractor	0.032	0.002	0.000	0.000	0.230	0.011	0.259	0.013	0.012	0.001
3,500 gallon Water Trucks	0.259	0.349	0.009	0.011	4.919	6.640	4.487	6.058	0.259	0.349
10-yard Dump Trucks	0.065	0.006	0.002	0.000	1.230	0.123	1.122	0.112	0.065	0.006
Pipe Trucks	0.207	0.062	0.007	0.002	3.935	1.181	3.590	1.077	0.207	0.062
Booster Trucks	0.052	0.011	0.002	0.000	0.984	0.216	0.897	0.197	0.052	0.011
Service Trucks	0.052	0.004	0.002	0.000	0.984	0.074	0.897	0.067	0.052	0.004
Light Pick-up Trucks	0.129	0.105	0.004	0.003	2.459	1.992	2.244	1.817	0.129	0.105
Total	**1.40**	**1.33**	**0.04**	**0.04**	**26.99**	**25.24**	**23.90**	**22.97**	**1.41**	**1.33**

Generators and other Combustion Sources

Emission Factors Source: AP-42 (5th Ed.) §3.3, Table 3.3-1, Uncontrolled Gasoline and Diesel Industrial Engines, 10/96

<600HP

Emission Unit	***Rating (hp)***	***Emission Factors (lb/hp-hr)***				
		PM_{10}	**SO_2**	**NOx**	**CO**	**VOC***
Generator #1	20	2.20E-03	2.05E-03	3.10E-02	6.68E-03	2.25E-03
Generator #2	20	2.20E-03	2.05E-03	3.10E-02	6.68E-03	2.25E-03
Generator #3	20	2.20E-03	2.05E-03	3.10E-02	6.68E-03	2.25E-03
Generator #4	20	2.20E-03	2.05E-03	3.10E-02	6.68E-03	2.25E-03
Auxillary Air Compressor	35	2.20E-03	2.05E-03	3.10E-02	6.68E-03	2.25E-03
Light Plant #1	15	2.20E-03	2.05E-03	3.10E-02	6.68E-03	2.25E-03
Light Plant #2	15	2.20E-03	2.05E-03	3.10E-02	6.68E-03	2.25E-03
Light Plant #3	15	2.20E-03	2.05E-03	3.10E-02	6.68E-03	2.25E-03
Light Plant #4	15	2.20E-03	2.05E-03	3.10E-02	6.68E-03	2.25E-03

* 91% of TOC

Emission Unit	**Operational Hours (hr/yr)**	**Emissions**									
		PM_{10}		**SO_2**		**NOx**		**CO**		**VOC**	
		lb/hr	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**
Generator #1	3,240	0.044	0.071	0.041	0.066	0.620	1.004	0.134	0.216	0.045	0.073
Generator #2	3,240	0.044	0.071	0.041	0.066	0.620	1.004	0.134	0.216	0.045	0.073
Generator #3	3,240	0.044	0.071	0.041	0.066	0.620	1.004	0.134	0.216	0.045	0.073
Generator #4	3,240	0.044	0.071	0.041	0.066	0.620	1.004	0.134	0.216	0.045	0.073
Auxillary Air Compressor	440	0.077	0.017	0.072	0.016	1.085	0.239	0.234	0.051	0.079	0.017
Light Plant #1	3,240	0.033	0.053	0.031	0.050	0.465	0.753	0.100	0.162	0.034	0.055
Light Plant #2	3,240	0.033	0.053	0.031	0.050	0.465	0.753	0.100	0.162	0.034	0.055
Light Plant #3	3,240	0.033	0.053	0.031	0.050	0.465	0.753	0.100	0.162	0.034	0.055
Light Plant #4	3,240	0.033	0.053	0.031	0.050	0.465	0.753	0.100	0.162	0.034	0.055
Total		**0.39**	**0.52**	**0.36**	**0.48**	**5.43**	**7.27**	**1.17**	**1.57**	**0.39**	**0.53**

Generators - HAP Emissions

Emission Factors Source: AP-42 (5th Ed.) §3.3, Table 3.3-2, Uncontrolled Diesel Engines, 10/96

Emission Unit	***Activity (MMBtu/hr)***
Generator #1	0.05
Generator #2	0.05
Generator #3	0.05
Generator #4	0.05
Auxillary Air Compressor	0.89
Light Plant #1	0.04
Light Plant #2	0.04
Light Plant #3	0.04
Light Plant #4	0.04

HAP	***Emission Factors (lb/MMBtu)***
Benzene	9.33E-04
Toluene	4.09E-04
Xylenes	2.85E-04
Formaldehyde	1.18E-03
Acetaldehyde	7.67E-04
Acrolein	9.25E-05
Naphthalene	8.48E-05

Emission Unit	***HAP Emissions***						
	Benzene	**Toluene**	**Xylenes**	**Formaldehyde**	**Acetaldehyde**	**Acrolein**	**Naphthalene**
	ton/yr	**ton/yr**	**ton/yr**	**ton/yr**	**ton/yr**	**ton/yr**	**ton/yr**
Generator #1	7.70E-05	3.37E-05	2.35E-05	9.74E-05	6.33E-05	7.63E-06	7.00E-06
Generator #2	7.70E-05	3.37E-05	2.35E-05	9.74E-05	6.33E-05	7.63E-06	7.00E-06
Generator #3	7.70E-05	3.37E-05	2.35E-05	9.74E-05	6.33E-05	7.63E-06	7.00E-06
Generator #4	7.70E-05	3.37E-05	2.35E-05	9.74E-05	6.33E-05	7.63E-06	7.00E-06
Auxillary Air Compressor	1.83E-04	8.02E-05	5.59E-05	2.31E-04	1.50E-04	1.81E-05	1.66E-05
Light Plant #1	5.77E-05	2.53E-05	1.76E-05	7.30E-05	4.75E-05	5.72E-06	5.25E-06
Light Plant #2	5.77E-05	2.53E-05	1.76E-05	7.30E-05	4.75E-05	5.72E-06	5.25E-06
Light Plant #3	5.77E-05	2.53E-05	1.76E-05	7.30E-05	4.75E-05	5.72E-06	5.25E-06
Light Plant #4	5.77E-05	2.53E-05	1.76E-05	7.30E-05	4.75E-05	5.72E-06	5.25E-06
Total	**7.22E-04**	**3.16E-04**	**2.21E-04**	**9.13E-04**	**5.93E-04**	**7.16E-05**	**6.56E-05**

Generators - GHG Emissions

Emission Factors Source: AP-42 (5th Ed.) §3.3, Table 3.3-1, Uncontrolled Gasoline and Diesel Industrial Engines, 10/96

<600HP

Emission Unit	**CO_2 Emission Factors (lb/hp-hr)**	**CH_4 Emission Factors (lb/hp-hr)**	**CO_2**		**CH_4**	
			lb/yr	**ton/yr**	**lb/yr**	**ton/yr**
Generator #1	1.15	2.47E-03	7.45E+04	3.73E+01	1.60E+02	8.00E-02
Generator #2	1.15	2.47E-03	7.45E+04	3.73E+01	1.60E+02	8.00E-02
Generator #3	1.15	2.47E-03	7.45E+04	3.73E+01	1.60E+02	8.00E-02
Generator #4	1.15	2.47E-03	7.45E+04	3.73E+01	1.60E+02	8.00E-02
Auxillary Air Compressor	1.15	2.47E-03	1.77E+04	8.86E+00	3.80E+01	1.90E-02
Light Plant #1	1.15	2.47E-03	5.59E+04	2.79E+01	1.20E+02	6.00E-02
Light Plant #2	1.15	2.47E-03	5.59E+04	2.79E+01	1.20E+02	6.00E-02
Light Plant #3	1.15	2.47E-03	5.59E+04	2.79E+01	1.20E+02	6.00E-02
Light Plant #4	1.15	2.47E-03	5.59E+04	2.79E+01	1.20E+02	6.00E-02
Total			**5.39E+05**	**2.70E+02**	**1.16E+03**	**5.79E-01**

Drilling Sources - Core Drills

(Emission Factor Source: AP-42 (5th Ed.) Section 11.9, Table 11.9-4 (Overburden Drilling 7/98))

EF_{TSP} =	1.30	lbs/hole	
EF_{PM10} = 0.52 x EF_{TSP} =	0.676	lbs/hole	Assumes TSP/PM10 =2
$EF_{PM2.5}$ = 0.03 x EF_{TSP} =	0.039	lbs/hole	AP-42 Table 11.9-1 Scaling Factors
Number of drill holes =	20	holes/yr	Snowstorm, August 22, 2012
Operating Hours =	22	hours/day	
	270	days/year	
	5,940	hours/year	

Emission Unit	PM_{10} Emission Factor (lbs/hole)	$PM_{2.5}$ Emission Factor (lbs/hole)	Holes Drilled (holes/yr)	Emission Controls		PM_{10} Emissions (lbs/hr)	PM_{10} Emissions (tons/yr)	$PM_{2.5}$ Emissions (lbs/hr)	$PM_{2.5}$ Emissions (tons/yr)
				ECF	Technology				
Drilling	0.68	0.04	20	80%	Water & Dust Skirting	0.0005	0.0014	0.00003	0.00008

Dozing

(Emission Factors Source: AP-42 (5th Ed.) §11.9, Table 11.9-1: Overburden Dozing, 7/98, footnotes d and e)

EF_{PM10} (lbs/hr) = $0.75 * 1 * (s^{1.5}) / (M^{1.4})$

$EF_{PM2.5}$ (lbs/hr) = $0.105 * 5.7 * (s^{1.2}) / (M^{1.3})$

Where:

s = material silt content (%)

M = material moisture content (%)

Emission Unit	Silt Content (%)	Moisture Content (%)	PM_{10} Emission Factor (lbs/hour)	$PM_{2.5}$ Emission Factor (lbs/hour)	Hours Dozing (hrs/yr)	Emission Controls		PM_{10} Emissions (lbs/hr)	PM_{10} Emissions (tons/yr)	$PM_{2.5}$ Emissions (lbs/hr)	$PM_{2.5}$ Emissions (tons/yr)
						ECF	Technology				
Dozer	8.0	2.00	6.43	2.95	50	0%	Uncontrolled	6.43	0.161	2.95	0.074

Grader

(Emission Factors Source: AP-42 (5th Ed.) §11.9, 10/98, Table 11.9-1: Grading, footnotes d and e)

EF_{PM10} (lb/VMT) = $0.60 * (0.051 * (s^{2.0}))$

$EF_{PM2.5}$ (lb/VMT) = $0.031 * (0.040 * (s^{2.5}))$

Where:

s = material silt content (%)

Emission Unit	Silt Content (%)	Mean Vehicle Speed (mph)	PM_{10} Emission Factor (lbs/hour)	$PM_{2.5}$ Emission Factor (lbs/hour)	Hours Operating (hrs/yr)	Emission Controls		PM_{10} Emissions (lbs/hr)	PM_{10} Emissions (tons/yr)	$PM_{2.5}$ Emission (lb/hr)	$PM_{2.5}$ Emission (tons/yr)
						ECF	Technology				
Grader	8.0	15	3.0	0.39	100	0%	Uncontrolled	3.00	0.15	0.39	0.02

Fugitive Emissions - Unpaved Roads

Emission Factors Source: AP-42 Section 13.2.2 Unpaved Roads, 11/06 (13.2.2.2 Emission Calculation and Correction Parameters)

$$E = k * (s/12)^a * (W/3)^b \quad (1a)$$

E = size specific EF (lb/VMT)
k = particle size multiplier (g/VMT)
s = surface material silt content (%)
W = average weight of vehicle (tons)
a = particle size constant
b = particle size constant

One way (miles) 5.64

PM_{10}											
	k (g/VMT)	**s (%)**	**W (tons)**	**a**	**b**	**E (lb/VMT)**	**Route Length (miles)**	**% Control**	**Control**	**lbs/hr**	**tons/yr**
Project Roads	1.5	8.00	1	0.9	0.45	0.6351913	11.27	75%	Water Sprays	9.05	6.53

$PM_{2.5}$											
	k (g/VMT)	**s (%)**	**W (tons)**	**a**	**b**	**E (lb/VMT)**	**Route Length (miles)**	**% Control**	**Control**	**lbs/hr**	**tons/yr**
Project Roads	0.15	8.00	1	0.9	0.45	0.0635191	11.27	75%	Water Sprays	0.91	0.65

Snowstorm CESA Analysis
PTE Totals Per Facility

Permit No.	Facility	Annual Emissions(Tons/Year)						
		PM	PM_{10}	$PM_{2.5}$*	NO_X	SO_2	CO	VOC
AP1041-3086.01	Atna Resources, Pinson Mine	20.69	20.69	20.69				0.01
AP1041-0292.02	Barrick Turquoise Ridge, Getchell Mine	77.54	18.54	18.54	72.82	9.43	5.99	3.32
AP1041-0723.02	Newmont Mining Company, Twin Creeks Mine	210.49	155.98	155.98	84.49	146.79	216.19	9.06
AP4911-0457.01	Sierra Pacific Power Company dba NV Energy, Valmy Generating Station	1858.20	1858.20	1858.20	14159.96	7009.46	73059.06	482.05
AP1442-0138.02	Ames Construction, Inc.	3.11	1.14	1.14				
AP1442-0090.02	H.E. Hunewill Construction	4.35	2.66	2.66	4.13	0.83	10.34	5.48
AP1041-0766.02	Newmont Mining Company, Midas Operations	84.63	47.28	47.28	10.10	2.03	6.17	0.96
AP1442-2385	Norman D Sweeney Construction	0.16	0.06	0.06				
AP1442-1240.02	Ranstorm Mining and Construction dba Ramco	0.67	0.24	0.24				
AP4812-2866	Verizon Wireless - Saipan Site	5.00	5.00	5.00	5.00	5.00	5.00	5.00
AP1442-1023.02	N A Degerstorm, Inc.**							
AP1611-0333.02	Humboldt Rady Mix, Inc.**							
	Total Emissions	**2,264.84**	**2,109.79**	**2,109.79**	**14,336.50**	**7,173.53**	**73,302.75**	**505.87**

* calculated from a 1:1 relationship with PM_{10}

** emissions not available because facilities are currently in the process of Permit renewal

Snowstorm CESA Analysis
Vehicle Emissions

	Emissions (lb/hr)					
	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC
Vehicles	3.11	3.21	76.59	4816.20	0.08	3.74
	Emissions (tons/yr)					
	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC
	13.64	14.08	335.44	21094.95	0.33	16.39

PM_{10} (including vehicle exhaust, tire wear, and brake wear)							
Section	**US-95**	**SR-290**	**SR-789**	**I-80**	**Shelton Rd**	**Midas Rd**	**TOTAL**
Route Length (miles)	17.40	39.70	27.50	0.58	22.40	33.65	
Emission Factor (g/mi)*	0.32245	0.32245	0.32245	0.32245	0.32245	0.12766	
Vehicles/day**	2,500	410	1,200	7,300	320	70	
lbs/hr	1.29E+00	4.82E-01	9.77E-01	1.25E-01	2.12E-01	2.76E-02	**3.11E+00**
tons/yr	5.64E+00	2.11E+00	4.28E+00	5.49E-01	9.30E-01	1.21E-01	**1.36E+01**
$PM_{2.5}$ (including vehicle exhaust, tire wear, and brake wear)							
Section	**US-95**	**SR-290**	**SR-789**	**I-80**	**Shelton Rd**	**Midas Rd**	**TOTAL**
Route Length (miles)	17.40	39.70	27.50	0.58	22.40	33.65	
Emission Factor (g/mi)*	0.33308	0.33308	0.33308	0.33308	0.33308	0.12266	
Vehicles/day**	2,500	410	1,200	7,300	320	70	
lbs/hr	1.33E+00	4.98E-01	1.01E+00	1.30E-01	2.19E-01	2.65E-02	**3.21E+00**
tons/yr	5.83E+00	2.18E+00	4.42E+00	5.67E-01	9.61E-01	1.16E-01	**1.41E+01**
NO_X							
Section	**US-95**	**SR-290**	**SR-789**	**I-80**	**Shelton Rd**	**Midas Rd**	**TOTAL**
Route Length (miles)	17.40	39.70	27.50	0.58	22.40	33.65	
Emission Factor (g/mi)*	7.92585	7.92584	7.92584	7.92584	7.92584	3.40149	
Vehicles/day**	2,500	410	1,200	7,300	320	70	
lbs/hr	3.17E+01	1.19E+01	2.40E+01	3.08E+00	5.22E+00	7.36E-01	**7.66E+01**
tons/yr	1.39E+02	5.19E+01	1.05E+02	1.35E+01	2.29E+01	3.22E+00	**3.35E+02**
CO							
Section	**US-95**	**SR-290**	**SR-789**	**I-80**	**Shelton Rd**	**Midas Rd**	**TOTAL**
Route Length (miles)	17.40	39.70	27.50	0.58	22.40	33.65	
Emission Factor (g/mi)*	485.05670	485.05670	485.05670	485.05670	485.05670	805.42970	
Vehicles/day**	2,500	410	1,200	7,300	320	70	
lbs/hr	1.94E+03	7.25E+02	1.47E+03	1.89E+02	3.19E+02	1.74E+02	**4.82E+03**
tons/yr	8.49E+03	3.18E+03	6.44E+03	8.26E+02	1.40E+03	7.63E+02	**2.11E+04**
SO_2							
Section	**US-95**	**SR-290**	**SR-789**	**I-80**	**Shelton Rd**	**Midas Rd**	**TOTAL**
Route Length (miles)	17.40	39.70	27.50	0.58	22.40	33.65	
Emission Factor (g/mi)*	0.00793	0.00793	0.00793	0.00793	0.00793	0.00191	
Vehicles/day**	2,500	410	1,200	7,300	320	70	
lbs/hr	3.17E-02	1.19E-02	2.40E-02	3.08E-03	5.22E-03	4.13E-04	**7.63E-02**
tons/yr	1.39E-01	5.19E-02	1.05E-01	1.35E-02	2.29E-02	1.81E-03	**3.34E-01**
VOC							
Section	**US-95**	**SR-290**	**SR-789**	**I-80**	**Shelton Rd**	**Midas Rd**	**TOTAL**
Route Length (miles)	17.40	39.70	27.50	0.58	22.40	33.65	
Emission Factor (g/mi)*	0.37669	0.37669	0.37669	0.37669	0.37669	0.63500	
Vehicles/day**	2,500	410	1,200	7,300	320	70	
lbs/hr	1.51E+00	5.63E-01	1.14E+00	1.47E-01	2.48E-01	1.37E-01	**3.74E+00**
tons/yr	6.59E+00	2.47E+00	5.00E+00	6.42E-01	1.09E+00	6.02E-01	**1.64E+01**

* Emission Factors from EPA MOVES 2010a

**Nevada DOT, Annual Traffic Report, 2011