FINAL

2000 AIR EMISSIONS INVENTORY

GRAND TETON NATIONAL PARK
WYOMING

U.S. NATIONAL PARK SERVICE

FEBRUARY 2003

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GRAND TETON NATIONAL **PARK**
WYOMING

***Prepared** for:*

National Park Service
WASO - Air Resources Division
12795 West Alameda Parkway
Denver, CO 80228

Prepared by:

EA Engineering, Science, and Technology, Inc.
15 Loveton Circle
Sparks, MD 21152
(410) 771-4950

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Cover Photo: The Grand Teton

CONTENTS

CONTENTS (Continued)

Page

FIGURES

TABLES

1. INTRODUCTION

1.1 BACKGROUND

In August of 1999, the National Park Service (NPS) embarked on the Natural Resource Challenge, a major effort to substantially improve how the NPS manages the natural resources under its care. As part of Natural Resource Challenge, the NPS Air Resources Division (ARD) was tasked with the responsibility of expanding efforts to monitor and understand air quality and related values in the parks. In addition, the NPS Environmental Leadership policy directs the NPS to manage the parks in a manner "that demonstrates sound environmental stewardship by implementing sustainable practices in all aspects of NPS management...." In order to achieve both of these objectives, it is necessary to gain an understanding of air pollution emissions that result from activities within the park. Development of an in-park air emissions inventory for Grand Teton National Park (NP) serves three functions in this regard. First, it provides an understanding of the sources and magnitude of in-park emissions and a basis for contrasting them with emissions from the surrounding area. Second, it identifies existing and potential strategies to mitigate in-park air emissions. Finally, it evaluates and ensures the compliance status of the park relative to state and federal air pollution regulations.

1.2 TYPICAL AIR EMISSION SOURCES

Typical air emission sources within NPS units include stationary, area, and mobile sources. Stationary sources can include fossil fuel-fired space and water heating equipment, generators, fuel storage tanks, and , wastewater treatment plants. Area sources may include woodstoves, campfires, and wildland and prescribed fires. Mobile sources may include vehicles operated by visitors, tour operators, and NPS employees, and nonroard vehicles and equipment.

1.3 INVENTORY METHODOLOGY

The methodology to accomplish the air emissions inventory was outlined in a protocol that was prepared at the initiation of the project (EA Engineering 2001). Tasks consisted of a site survey in October 2001, interviews with Grand Teton NP [1] and concessionaire personnel, review of applicable park records, emission calculations, review of applicable state air quality regulations, an assessment of mitigation measures and potential emission reduction initiatives, and report preparation. The data were used in conjunction with a number of manual and computer software computational tools to calculate emissions. Computational tools included U.S. Environmental

[1] Bob Schiller, Grand Teton NP, Chief, Science and Resource Management (307) 739-3481

Protection Agency (USEPA) emission factors such as the Factor Information Retrieval System (FIRE) database, USEPA *TANKS 4.0* model, U.S. Forest Service *First Order Fire Effects Model (FOFEM) 4.0* model, and USEPA *MOBILE6.2and PARTS* mobile source emissions model. The Federal Aviation Administration model *Emissions and Dispersion Modeling System (EDMS)* was utilized to estimate emissions from aircraft and ground support equipment from Jackson Hole Airport, which is located on park property. The year 2000 was selected as the basis for the air emission inventory since data for that year were the most recent available at the park. It should be noted that emissions are expected to vary from year to year due to fluctuations in visitation, prescribed and wildland fires, and other activities. Additional information on emission estimation methodology, including emission factors, are provided in Appendices A and B.

1.4 PARK DESCRIPTION

Towering more than a mile above the valley of Jackson Hole in northwest Wyoming, the Grand Teton rises to 13,770 feet, and twelve Teton peaks reach above 12,000 feet and support a dozen mountain glaciers. The west side of the range slopes gently, showing the angle of tilt of the Earth's crust. The Teton Range is the youngest range in the Rockies and displays some of North America's oldest rocks. First established in 1929, Grand Teton National Park first consisted of the mountain range and several glacial lakes. Later the valley floor was protected as Jackson Hole National Monument, and the two areas were combined in 1950 (Figure 1).

Today the park encompasses nearly 310,000 acres and protects the Teton Range, the Jackson Hole mountain valley, a 50-mile portion of the Snake River, seven morainal lakes, over 100 backcountry and alpine lakes, and a wide range of wildlife and plant species. Climbing, hiking and backpacking, camping, fishing, wildlife and bird watching, horseback riding, boating on Jackson and Jenny Lakes, rafting on the Snake River, bicycling, and photography are all common activities in the area. About 4 million visitors enjoy the park each year, with most visiting between Memorial Day Weekend and Labor Day.

Located at the heart of the Greater Yellowstone Ecosystem, the John D. Rockefeller, Jr. Memorial Parkway connects Grand Teton and Yellowstone National Parks. In 1972, Congress dedicated a 24,000-acre parcel of land to recognize the generosity and foresight of the conservationist and philanthropist John D. Rockefeller, Jr. Congress also named the highway from the south boundary of Grand Teton NP to West Thumb in Yellowstone NP in honor of Rockefeller. The parkway provides a natural link between the two national parks and contains features characteristic of both areas. Grand Teton NP administers John D. Rockefeller, Jr. Memorial Parkway, and air emission sources on these lands are included in this inventory.

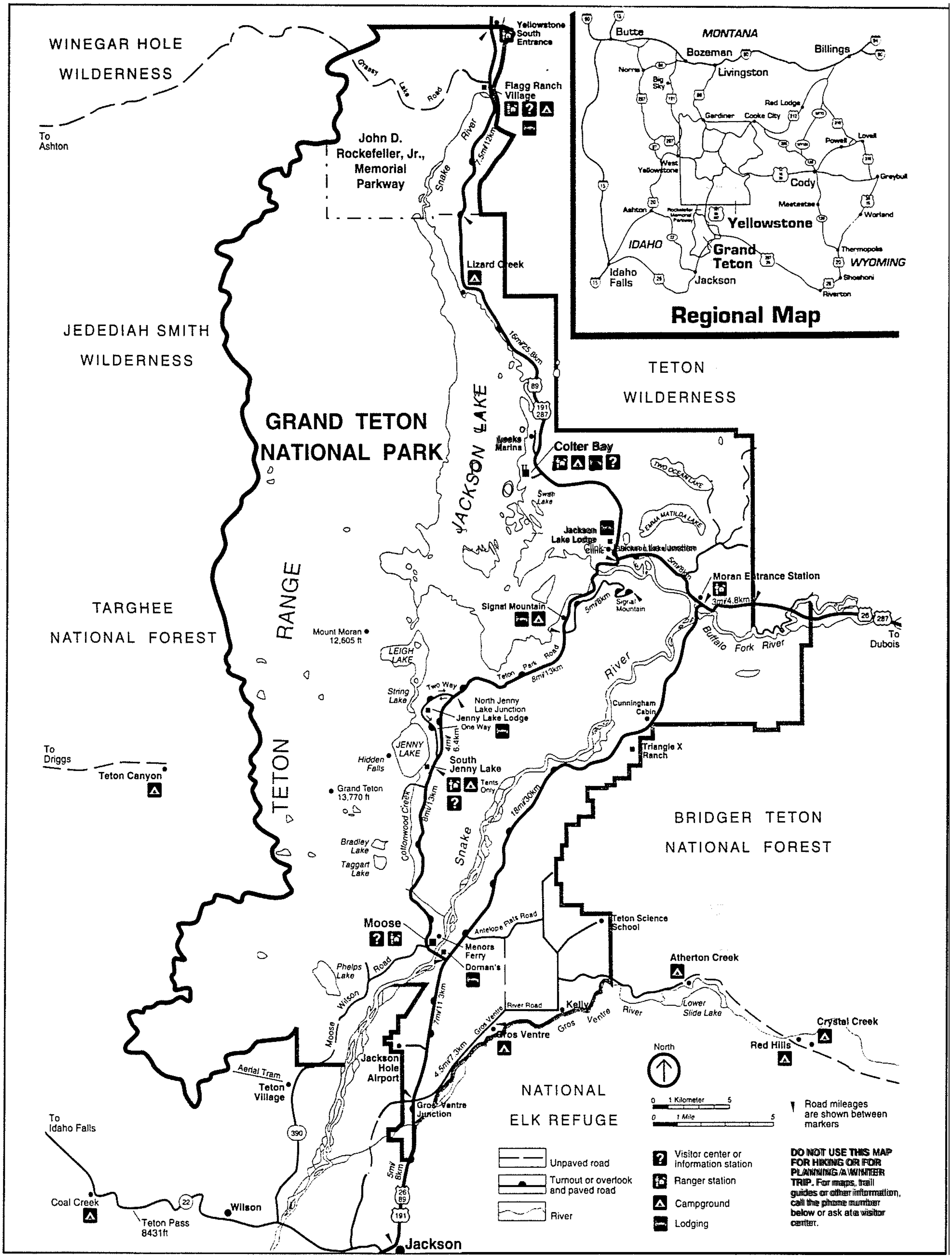

FIGURE 1. GRAND TETON NATIONAL PARK AND JOHN D. ROCKEFELLER, JR., MEMORIAL PARKWAY

Information on developed areas in the park is summarized in Table 1, and site maps of many of these developed areas are provided in Appendix C. Commercial services in the park that are authorized under concession contracts that may generate air emissions include lodging, food services, campstores and other retail establishments, boat tours and small boat rentals, and some transportation tours and services. The majority of these commercial services are open only during the summer visitation season. There are approximately 150 private in-holdings located on 970 acres within the park boundaries, and about two-thirds of these are residences. The State of Wyoming also has approximately 1,366 acres of in-holdings in the park, and Teton County has 13 acres.

TABLE 1: GRAND TETON NP DEVELOPED AREAS

Name/Location	Function/Facilities
Moose[1]	Visitor Center/Park Headquarters, Maintenance Shops, Employee Housing
Colter Bay Village and Marina	Visitor Center, Gift Shops, Museum, Lodging, Restaurant, Public Service Gas Station, Laundromat, Marina, and Boat and Canoe Rental
Jackson Lake Lodge	Lodge, Restaurant, Gift Shop, Public Service Gas Station, Medical Clinic, Employee Housing
Signal Mountain Lodge	Lodge, Restaurant, Public Service Gas Station, Boat Rentals, Employee Housing
Jenny Lake Lodge	Lodge, Restaurant
South Jenny Lake	Boating, Groceries/Supplies
Leeks Marina	Marina, Restaurant, Boat Rentals
Triangle X Ranch Village[2]	Cabins, Public Service Station
Flagg Ranch[3]	Lodging, Restaurant, Groceries/Supplies, Gift Shop, Public Service Station, Employee Housing
Jackson Hole Airport	Commercial airport served by American, United, and other airlines, rental car companies, and other services

1 There are other private in-holding businesses next to the park headquarters/visitor center in Moose, including a public service gas station, Spur Ranch Cabins lodging, restaurant, grocery/deli, gift shop, fishing shop, and mountaineering shop
2 Private in-holding
3 Located along John D. Rockefeller, Jr., Memorial Parkway

1.5 AIR QUALITY STATUS

Grand Teton NP and the John D. Rockefeller, Jr., Memorial Parkway are located in Teton County, WY, and the Wyoming Depai trrrent of Environmental Quality (DEQ) is the governing authority for regulating air pollution from stationary sources in the state. Teton County is classified as attainment for all the National Ambient Air Quality Standards (NAAQS). One ozone monitor is located in Teton County, and the maximum ozone measurement recorded at this site since 1996 was 0.073 parts per million (ppm), which compares to the federal 1-hour standard of 0.12 ppm.

Grand Teton NP is one of 49 NPS units that are designated as Class I areas by the Clean Air Act and its Amendments. A Class I area is one that receives the most stringent degree of air quality protection within and around its borders. For example, potential new or modified sources of significant pollution that plan to locate near a Class I area must obtain a permit from the applicable air quality regulatory agency. The NPS has significant input to the permitting process to ensure that potential air emissions do not pose a threat to visibility or other park resources.

2. STATIONARY AND AREA SOURCE EMISSIONS

This section summarizes emissions from stationary sources at Grand Teton NP for the year 2000. The discussion is divided into sections covering emissions from combustion sources, fuel storage sources, and area sources. The following emissions were calculated for each source: particulate matter (PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NO_X), carbon monoxide (CO), carbon dioxide ($C0_2$), and volatile organic compounds (VOCs). Emission factors used in the calculations are provided in Appendices A and B.

2.1 STATIONARY SOURCES

2.1.1 Space And Water Heating Equipment

Stationary combustion sources at Grand Teton NP include approximately 80 NPS No. 2 fuel oil and propane space and water heating units, including 58 employee housing heating units, and an additional 200 heating units operated by concessionaires. There are also two boilers at the Jackson Hole Airport, which leases its property from the NPS. Table 2 provides any inventory of these heating units.

Criteria air emissions were calculated using the appropriate residential and commercial unit emission factors. For example, PM emissions from a No. 2 fuel oil boiler at the main Visitor Center in Moose are calculated as follows:

$$6{,}828\ gal/yr \times \frac{2.01b\ PM}{1{,}000\ gal} = 14\ lb\ PM/yr$$

Actual criteria pollutant emissions from space and water heating equipment are summarized in Table 3. Potential emissions also were calculated by assuming that the heating units were operated continuously during the year or 8,760 hours per year. These emissions are summarized in Table 4.

TABLE 2: HEATING EQUIPMENT AT GRAND TETON NP

Location	Capacity (Btu/hr)	Number	Fuel Type
	Grand Teton National Park		
Moose Visitor Center	1,700,000	1	No. 2 fuel oil
Moose Maintenance Building	1,688,000	2	No. 2 fuel oil
Colter Bay Upper Laundry	125,000	1	No. 2 fuel oil
Colter Bay Lower Laundry	125,000	1	No. 2 fuel oil
Beaver Creek Employee Housing	125,000	4	No. 2 fuel oil
Colter Bay	1,700,000	1	Propane
Colter Bay	200,000	2	Propane
Colter Bay	200,000	1	Propane
Moran Entrance Station	80,000	1	Propane
NPS Employee Housing	80,000	58	Propane
Jackson	**Lake Lodge (Grand Teton Lodge Company)**		
Dorm 13	390,000	1	No. 2 fuel oil
Main Lodge	8,296,000	1	No. 2 fuel oil
General Manager House	90,000	2	Propane
900 Building	1,350,000	1	Propane
Main Lodge	400,000	2	Propane
Service Station	200,000	1	Propane
Staff Housing	300,000	12	Propane
Employee Lounge	200,000	2	Propane
Employee Kitchen Equipment	Unknown	3	Propane
Staff Housing	150,000	9	Propane
Pool Kitchen Equipment	Unknown	4	Propane
Colter	**Bay** Village **(Grand Teton** Lodge Company)		
Chuckwagon	1,900,000	1	No. 2 fuel oil
Laundrette	1,800,000	1	No. 2 fuel oil
Cbv Dorms	500,000	1	Propane
Jenny	**Lake Lodge (Grand** Teton **Lodge Company)**		
Lodge	850,000	2	Propane
	Triangle X Ranch		
Cabins	100,000	52	Propane
	Flagg Ranch Resort		
Lodge	150,000	8	Propane
Cabins	25,000	48	Propane
Cabins	40,000	48	Propane
Lodge	200,000	2	Propane
Maintenance/Laundry	200,000	3	Propane
	Jackson Hole Airport		
Control Tower	800,000	2	No. 2 fuel oil

TABLE 3: 2000 ACTUAL CRITERIA EMISSIONS FROM HEATING EQUIPMENT AT GRAND TETON NP

Location	Fuel Type	Consumption (gal/yr)	PM_{10} (lbs/yr)	SO_2 (lbs/yr)	NO_X (lbs/yr)	CO (lbs/yr)	CO_2 (lbs/yr)	VOC (lbs/yr)
National Park Service								
Moose Visitor Center	No. 2 oil	6,828	14	485	137	34	146,802	2
Moose Maintenance Bldg	No. 2 oil	13,560	27	963	271	68	291,532	5
Colter Bay Upper Laundry	No. 2 oil	502	0	36	9	3	10,794	0
Colter Bay Lower Laundry	No. 2 oil	502	0	36	9	3	10,794	0
Beaver Creek Housing	No. 2 oil	2,008	1	143	36	10	43,177	1
Colter Bay	Propane	9,214	4	0	129	18	115,179	3
Colter Bay	Propane	2,168	1	0	30	4	27,101	1
Colter Bay	Propane	1,084	0	0	15	2	13,550	0
Moran Entrance Station	Propane	434	0	0	6	1	5,420	0
NPS Employee Housing	Propane	33,640	13	0	471	64	420,500	10
		Subtotal	61	1,661	4	205	1,084,849	23
Jackson Lake Lodge (Grand Teton Lodge Company								
Dorm 13	No. 2 oil	5,000	10	355	100	25	107,500	2
Main Lodge	No. 2 oil	70,000	140	4,970	1,400	350	1,505,000	24
General Manager House	Propane	500	0	0	7	1	6,250	0
900 Building	Propane	2,500	1	0	35	5	31,250	1
Main Lodge	Propane	14,350	6	0	201	29	179,375	4
Service Station	Propane	350			5	1	4,375	
Staff Housing	Propane	4,500			63	9	56,250	
Employee Lounge	Propane	4,000	2	0	56	8	50,000	1
Employee Kitchen Eqpt	Propane	7,500	3	0	105	15	93,750	2
Staff Housing	Propane	750	0	0	11	2	9,375	0
Pool Kitchen Equipment	Propane	3,500	1	0	49	7	43,750	1
		Subtotal	165	5,326	2,032	452	2,086,875	36
Colter Bay Village (Grand Teton Lodge Company								
Chuckwagon	No. 2 oil	12,000	5	852	216	60	258,000	9
Laundrette	No. 2 oil	8,100	3	585	146	41	174,150	6
Cbv Dorms	Propane	2,500	1	0	35	5	31,250	1
		Subtotal	9	1,427	397	106	463,400	16
Jenny Lake Lodge (Grand Teton Lodge Company								
Lodge	Propane	2,500			35		31,250	1
Triangle X Ranch								
Cabins	Propane	20,966			294	42	262,075	6
Flagg Ranch Resort								
Lodge	Propane	2,000	1	0	28	4	25,000	1
Cabins	Propane	5,000	2	0	70	10	62,500	2
Cabins	pane	2,500	1	0	35	5	31,250	1
Lodge	Propane	1,000	0	0	14	2	12,500	0
Maintenance/Laundry	Propane	1,500	1	0	21	3	18,750	0
		Subtotal	5		168	24	150,000	4
Jackson Hole Airport								
Control Tower	No. 2 oil	4,000		284	80	20	86,000	1
Totals								
		lbs/yr	256	8,700	4,120	860	4,164,450	86
		tons/yr	0.13	4.35	2.06	0.43	2,082	0.04

TABLE 4: 2000 POTENTIAL CRITERIA EMISSIONS FROM HEATING EQUIPMENT AT GRAND TETON NP

Location	Fuel Type	Consumption (gal/yr)	PM_{10} (lbs/yr)	SO_2 (lbs/yr)	NO,; (lbs/yr)	CO (lbs/yr)	CO_2 (lbs/yr)	VOC (lbs/yr)
National Park Service								
Moose Visitor Center	No. 2 oil	106,371	213	7,552	2,127	532	2,286,986	36
Moose Maintenance Bldg	No. 2 oil	211,241	422	14,998	4,225	1,056	4,541,685	72
Colter Bay Upper Laundry	No. 2 oil	7,821	3	555	141	39	168,161	6
Colter Bay Lower Laundry	No. 2 oil	7,821	3	555	141	39	168,161	6
Beaver Creek Housing	No. 2 oil	31,286	13	2,221	563	156	672,643	22
Colter Bay	Propane	162,754	65	3	2,279	326	2,034,426	49
Colter Bay	Propane	38,295	15	1	536	77	478,689	11
Colter Bay	[illegible]lane	19,148	8	0	268	38	239,344	6
Moran Entrance Station	Propane	*7,659*	*3*	0	107	15	95,738	2
NPS Employee Housing	Propane	444,223	178	8	6,219	888	5,552,787	133
		Subtotal	923	25,895	16,606	3,166	16,238,620	343
Jackson Lake Lodge (Grand Teton Lodge Companv)								
Dorm 13	No. 2 oil	24,403	49	1,733	488	122	524,661	8
Main Lodge	No. 2 oil	519,093	1,038	36,856	10,382	2,595	11,160,490	176
General Manager House	Propane	17,233	7	0	241	34	215,410	5
900 Building	Propane	129,246	52	2	1,809	258	1,615,574	39
Main Lodge	Propane	76,590	31	1	1,072	153	957,377	23
Service Station	Propane	19,148	8	0	268	38	239,344	6
Staff Housing	Propane	344,656	138	6	4,825	689	4,308,197	103
Employee Lounge	Propane	38,295	15	1	536	77	478,689	11
Employee Kitchen Eqpt	Propane	28,721	11	1	402	57	359,016	9
Staff Housing	Propane	129,246	52	2	1,809	258	1,615,574	39
Pool Kitchen Equipment	Propane	38,295	15	1	536	77	478,689	11
		Subtotal	1,416	38,603	22,368	4,358	21,953,021	430
Colter Bay Village (Grand Teton Lodge Company)								
Chuckwagon	No. 2 oil	118,886	48	8,441	2,140	594	2,556,043	85
Laundrette	No. 2 oil	112,629	45	7,997	2,027	563	2,421,514	80
Cbv Dorms	Propane	47,869	19	1	670	96	598,361	14
		Subtotal	112	16,439	4,837	1,253	5,575,918	179
Jenny Lake Lodge (Grand Teton Lodge Company)								
Lodge	Propane	162,754	65	3	2,279	326	2.034,426	49
Triangle X Ranch								
Cabins	Propane	497,836	199	9	6,970	996	6,222,951	149
Flagg Ranch Resort								
Lodge	Propane	114,885	46	2	1,608	230	1,436,066	34
Cabins	Propane	114,885	46	2	1,608	230	1,436,066	34
Cabins	Propane	183,816	74	3	2,573	368	2,297,705	55
Lodge	Propane	38,295	15	1	536	77	478,689	11
Maintenance/Laundry	Pro[illegible]	57,443	23	1	804	115	718,033	17
		Subtotal	204	9	7,129	1,020	6,366,559	151
Jackson Hole Airport								
Control Tower	No. 2 oiI	100,114	200	7,108	2.002	501	2,152,457	34
Totals								
		lbs/yr	3,120	88,065	62,190	11,620	48,858,800	1,335
		tons/yr	1.56	4.41	31.10	5.81	24,429	0.67

2.1.2 Generators

2.1.2.1 Generator Emissions - Actual

Emissions were calculated by multiplying the unit rating (kW) of the generators by an estimated annual run time (hr/yr) to get the kW-hr/yr, and the appropriate emission factors were then applied. For example, PM emissions from the 125 kW generator at the Moose Visitor Center are calculated as:

$$125\ kW \times \frac{52\ hours}{year} \times \frac{[1.34\ hp}{kW} \times \frac{0.00220\ lb\ PM}{hp - hr} -19\ lb\ PM/yr$$

Actual generator criteria emissions are summarized in Table 5.

2.1.2.2 Generator Emissions - Potential

Potential emissions were also calculated for the generators, and the same emission factors that were used to calculate the actual emissions were used to calculate these potential emissions. To calculate potential emissions, EPA guidance on the number of hours of operation to assume was adopted:

> EPA does not recommend the use of 8,760 hours per year (i.e., full-year operation) for calculating PTE (potential to emit) for emergency generators...The EPA believes that 500 hours is an appropriate default assumption for estimating the number of hours that an emergency generator could be expected to operate under worst-case conditions.[1]

Potential criteria generator emissions are summarized in Table 6.

Calculating Potential to Emit (PTE) for Emergency Generators, Office of Air Quality Planning and Standards (MD-10), U.S. Environmental Protection Agency, 06 September 1995.

TABLE **5: 2000** ACTUAL GRAND TETON NP GENERATOR CRITERIA EMISSIONS

Facility	**Fuel**	**Rating (kW)**	**Run Time (hrs/yr)**	**Output (kW-hr/yr)**	**PM10 Obs/yr)**	**SO_2 Obs/yr)**	NOx **Obs/yr)**	**CO (ibs/yr)**	**CO_2 (lbs/yr)**	**VOC (Ibs/yr)**
National Park Service										
Moose Visitor Center	Diesel	125	52	6,500	19	18	270	58	10,017	22
Moose Maintenance	Diesel	300	52	15,600	46	43	648	140	24,040	52
Colter Bay Visitor Center	Diesel	60	52	3,120	9	9	130	28	4,808	10
Colter Bay Lift Station	Diesel	40	52	2,080	6	6	86	19	3,205	7
Jenny Lake	Diesel	40	52	2,080	6	6	86	19	3,205	7
Jackson Lake Lodge										
Main Lodge	Diesel	500	65	32,500	96	176	1,045	240	50,083	28
Main Lodge	Diesel	360	65	23,400	22	*64*	*753*	172	36,059	20
Main Lodge	Gasoline	5	25	125	0	0	2	74	181	4
Colter Bay Village										
Main Lodge	Diesel	200	60	12,000	35	**33**	498	107	18,492	40
Grocery Store	Diesel	250	60	15,000	44	41	623	134	23,115	50
Laundrette	Diesel	75	60	4,500	13	12	187	40	6,935	15
Cabin Office	Gasoline	5	40	200	0	0	3	118	289	6
Jenny Lake Lodge										
Main Lode	Diesel	200	60	12,000	35	33	--198	107	18,492	40
Flagg Ranch Resort										
Lower Flagg	Diesel	500	25	12,500	12	68	402	92	19,263	11
Upper Flagg	Diesel	400	25	10,000	29	27	415	90	15,410	34
Jackson Hole Airport										
FAA/VOR	Propane	30	52	1,560	0	3	7	2		0
Terminal	Diesel	600	52	31,200	29	169	1,003	230	48,079	27
Tower	Diesel	50	52	2,600	8	7	108	23	4,007	9
Tower	Diesel	25	52	1,300	4	4	54	12	2,003	4
Jackson Lake Dam, Bureau of Reclamation										
Shop/Residence	Diesel	200	52	10,400	31	29	432	93	16,026	35
				Totals (lb/yr)	446	747	7,252	1,797	303,708	422
				Totals (tons/yr)	0.22	0.37	3.63	0.90	151.85	0.21

TABLE 6: 2000 POTENTIAL GRAND TETON NP GENERATOR CRITERIA EMISSIONS

Facility	Fuel	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PM_{10} (lbs/yr)	SO_2 (lbs/yr)	NOx (lbs/yr)	CO (lbs/yr)	CO_2 (lbs/yr)	VOC (lbs/yr)
	National Park Service									
Moose Visitor Center	Diesel	125	500	62,500	184	172	2,596	559	96,313	210
Moose Maintenance	Diesel	300	500	150,000	442	412	6,231	1,343	231,150	505
Colter Bay Visitor Center	Diesel	60	500	30,000	88	82	1,246	269	46,230	101
Colter Bay Lift Station	Diesel	40	500	20,000	59	55	831	179	30,820	67
Jenny Lake	Diesel	40	500	20,000	59	55	831	179	30,820	67
	Jackson Lake Lodge									
Main Lodge	Diesel	500	500	250,000	235	1,355	8,040	1,843	385,250	214
Main Lodge	Diesel	360	500	180,000	169	976	57,888	13,266	277,380	1,544
Main Lodge	Gasoline	5	500	2,500	2	2	37	1,471	3,618	74
	Colter Bay Lodge									
Main Lodge	Diesel	200	500	100,000	295	275	4,154	895	154,100	336
Grocery Store	Diesel	250	500	125,000	369	343	5,193	1,119	192,625	420
Laundrette	Diesel	75	500	37,500	111	103	1,558	336	57,788	126
Cabin Office	Gasoline	5	500	2,500	2	2	37	1,471	3,618	74
	Jenny Lake Lodge									
Main Lodge	Diesel	200	500	100,000	9	275	4,154	895	154,100	336
	Flagg Ranch Resort									
Lower Flagg	Diesel	500	500	250,000	235	1,355	8,040	1,843	385,250	214
Upper Flagg	Diesel	400	500	200,000	590	549	8,308	1,790	308,200	673
	Jackson Hole Airport									
FAA/VOR	Propane	30	500	15,000	3	27	71	17	--	4
Terminal	Diesel	600	500	300,000	281	1,626	9,648	2,211	462,300	257
Tower	Diesel	50	500	25,000	74	69	1,039	224	38,525	84
Tower	Diesel	25	500	12,500	37	34	519	112	19,263	42
	Jackson Lake Dam, Bureau of Reclamation									
Shop/Residence	Diesel	200	500	100,000	295	275	4,154	895	154,100	336
				Totals (lb/yr)	3,824	8,042	72,404	18,958	3,031,449	4,292
				Totals (tons/yr)	1.91	4.02	36.20	9.48	1,515.72	2.15

2.1.3 Fuel Storage Tanks

Grand Teton NP has about 20 underground and aboveground storage tanks, and information on these tanks is provided in Tables 8 and 9. Emissions from fuel storage tanks were calculated using the EPA *TANKS 4.0* model. The gasoline tanks are equipped with Phase I vapor emission controls that capture vapors displaced from the vapor space in the tank when it is refilled. Emissions associated with gasoline dispensing are accounted for in the mobile source model.

There are two basic types of VOC emissions from storage tanks: working losses and standing losses. Working losses are composed of both withdrawal and refilling loss emissions. Withdrawal loss emissions result from the vaporization of liquid fuel residue on the inner surface of tank walls as the liquid levels in the tank are decreased and air is drawn into the tank. Refilling losses refer to fuel vapor releases to the air during the process of refilling the tank as the liquid level in the tank increases and pressurizes the vapor space. Standing losses describe those tank emissions from the vaporization of the liquid fuel in storage due to changes in ambient temperatures. VOC losses are also a direct function of the annual product throughput or turnovers. VOC emissions from gasoline and Jet A fuel storage tanks are summarized in Tables 7 and 8, respectively. The *TANKS* model inputs and outputs are included in Appendix **B.**

2.1.4 Wastewater Treatment Plants

The NPS operates only one wastewater treatment plant at Moose Village in Grand Teton NP. Using a VOC emission factor of 8.9 lbs VOC/million gallons of influent treated, the estimated actual emissions are summarized in Table 12. Potential emissions based on the design capacity of the plant also are noted in Table 9.

TABLE 9: GRAND TETON NP WASTEWATER TREATMENT PLANT EMISSIONS

Location	Design Capacity (gal/day)	Wastewater Treated (gaUyr)	VOC (lbs/yr)	
			Actual	Potential
Moose Village	37,500	4,380,000	39	122

TABLE 7: GRAND TETON NP GASOLINE STORAGE TANK EMISSIONS

Location	Number	Type	Volume (gal)	Throughput (gal/yr)	VOC (lbs/yr)
National Park Service					
Moose Maintenance	1	UST	10.000	37,500	227
Colter Bay Maintenance	1	UST	10,000	37,500	227
Grand Teton Lodge Company					
Jackson Lake Lodge Service Station	2	UST	10,000	143,000	868
Colter Bay Convenience Store	2	UST	10,000	143,000	868
Colter Bay Marina	1	UST	5,000	70,000	424
Colter Bay Village Service Station	2	UST	10,000	143,000	868
Triangle X Ranch					
Maintenance Area	1	UST	5,000	17,220	104
	1	UST	5,000	3,181	19
Flagg Ranch Resort					
Village Service Station	1	UST	15,000	20,000	121
	1	UST	10,000	13,000	79
Signal Mountain Lodge					
Convenience Store	1	UST	12,000	87,500	531
	1	UST	8,000	31,650	192
	1	UST	2,000	9,200	56
Bureau of Reclamation					
Jackson Lake Dam	1	AST	1,000	750	142
Jackson Hole Airport					
Hertz	1	UST	10,000	40,000	243
Avis	1	UST	10,000	25,000	152
Alamo	1	UST	10,000	25,000	152
Budget	1	UST	12,000	20,000	122
Fuel Farm (AVGAS)	1	UST	10,000	42,000	194
Satellite Fuel Farm (AVGAS)	1	UST	12,000	50,000	231
				958,000	5,680

TABLE 8: GRAND TETON NP JET A FUEL STORAGE TANK EMISSIONS

Location	Number	Type	Volume (gal)	Throughput (gaUyr)	VOC (lbs/yr)
Jackson Hole Airport					
Fuel Farm	1	UST	15,000	773,000	11
	1	UST	10,000	515,000	7
Satellite Fuel Farm	1	UST	12,000	645,000	12
	1	UST	12,000	645,000	12
				2,578,000	42

2.2 AREA SOURCES

2.2.1 Woodstoves/Fireplaces

There are approximately 43 woodstoves, mostly in employee residences, and seven woodstoves in concessionaire cabins in Grand Teton NP. Park and concessionaire personnel provided estimates of wood consumption, and the estimated emissions are summarized in Table 10.

TABLE 10: WOODSTOVE AND FIREPLACE AIR EMISSIONS FROM GRAND TETON NP

Location	Number	Fuel Consumption	PM (lbs/yr)	SO_2 (lbs/yr)	NOx (lbs/yr)	CO (lbs/yr)	VOC (lbs/yr)
Woodstoves							
Employee Residences	40	140 cords/yr	8,500	98	640	62,064	56,265
Triangle X Ranch	3	4 cords/yr	243	3	18	1,773	1,610
Fireplaces							
Signal Mountain Lodge Cabins	3	6 cords/yr	540	6	41	3,940	3,572
Signal Mountain Lodge Lobby	1	0.5 cords/yr	45	1	3	328	300
Triangle X Ranch	3	1 lcords/yr	990	11	74	7,224	6,550
	Total	lbs/yr	10,318	120	775	75,330	68,290
		tons/yr	5.16	0.06	0.40	37.67	34.15

2.2.2 Campfires

There are five campgrounds with about 900 campsites in Grand Teton NP. Park personnel estimated that these sites were occupied between 90 and 170 days during the visitation season and that approximately 90 percent had an evening or morning campfire at each site. Assuming that each campfire site consumes approximately 15 lbs of wood, air emissions from campsites in 1998 were calculated and are summarized in Table 11.

TABLE 11: 2000 GRAND TETON NP CAMPFIRE EMISSIONS

Location	Campfires	Fuel (tons/yr)	PM_{10} (lbs/yr)	SO_2 (lbs/yr)	NOx (lbs/yr)	CO (lbs/yr)	VOC (lbs/yr)
Gros Ventre	54,110	400	14,040	160	1050	102,500	92,930
Jenny Lake	6,300	50	1,640	20	125	11,950	10,830
Signal Mountain	11,400	85	2,950	35	225	21,550	19,540
Colter Bay	39,700	300	10,300	120	775	75,200	68,170
Lizard Creek	4,750	35	1,230	15	100	9,000	8,160
Total	116,260	870	30,160	350	2,275	220,200	199,630
					tons/yr		
			15.08	0.17	1.131	110.101	99.82

2.2.3 Wildland Fires and Prescribed Burning

Wildland fires are ignited naturally, usually by lightening and are typically suppressed, while prescribed fires are ignited intentionally in order to achieve fire management objectives. Prescribed burning is a land treatment process to accomplish natural resource management objectives, including reducing the potential for destructive wildfires, eliminating excessive fuel buildup, controlling insects and disease, improving wildlife habitat and forage production, maintaining natural succession of plant communities, and restoring natural processes. Only prescribed burning emissions are considered as anthropogenic emissions; however, to the extent that prescribed burning is conducted to achieve ecological benefit, the emissions could be considered natural.

The First Order Fire Effects Model (FOFEM) was used to estimate emissions. FOFEM is a computer program developed by the Intermountain Fire Sciences Lab, U.S. Forest Service to predict the effects of prescribed fire and wildfire in forests and rangelands throughout the U.S. In particular, it quantifies emissions of PM_{10}, $PM_{2.5}$, CH_4, CO, and $C0_2$, which are summarized in Table 12.

TABLE **12: AIR EMISSIONS FROM WILDFIRE** IN GRAND TETON NP IN **2000**

Fire Name	Acres	PM_N (lbs/yr)	PM2.5 (lbs/yr)	VOC' (lbs/yr)	CO (lbs/yr)	CO_2 (lbs/yr)
Glade	2,464	1,611,456	1,365,056	825,440	18,048,800	82,236,000
Hetchman	661	432,294	366,194	221,435	4,841,825	22,060,875
Berry II	2	981	831	503	10,988	50,063
Wilcox	2,979	1,948,266	1,650,366	997,965	21,821,175	99,424,125
Moran	3,351	2,191,554	1,856,454	1,122,585	24,546,075	111,839,625
Snowshoe	200	130,800	110,800	67,000	1,465,000	6,675,000
Total	9,657	6,315,351	5,349,701.5	3,234,928	70,733,863	322,285,688

As methane (CH_4)

It should be noted that annual variations in emissions from prescribed burning can be high due to meteorological conditions and/or local air quality levels. Actual emissions from fires occur on a seasonal basis, with most typically occurring from June to October. The data for fires in 2000 reflect an unusually high number of acres burned due to lightening strikes and occurred in forest areas, and thus may represent a worst case year for Grand Teton NP. By comparison, in 2001, fire consumed 172 acres, and of these, 152 acres were prescribed burns in areas dominated by sagebrush, which would produce significantly less air emissions. Prior to 2000, the average for wildland fires was 326 acres and for prescribed fires 2,160 acres per year.

2.2.4 Miscellaneous Area Sources

Miscellaneous area sources include food preparation, degreasers, paints and other surface coatings, lighter fluid consumption, consumer solvents, propane use by visitors in recreational vehicles, and highway maintenance, such as paving materials. However, few data on these activities and products were available.

2.3 SUMMARY OF STATIONARY AND AREA SOURCE EMISSIONS

Table 13 summarizes the stationary and area source emissions calculated above in a format that allows comparison between the various sources as well as providing totals for each pollutant or pollutant category under consideration.

TABLE 13: SUMMARY OF 2000 STATIONARY AND AREA SOURCE EMISSIONS AT GRAND TETON NP

Activity	Particulates		Sulfur Dioxide		Nitrogen Oxides		Carbon Monoxide		Carbon Dioxide		VOCs	
	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr
Stationary Combustion Sources												
Space and Water Heating Units	256	0.13	8,700	4.35	4,120	2.06	860	0.43	4,164,450	2,082	86	0.04
Generators	446	0.22	747	0.37	7,252	3.63	1,797	0.90	303,708	152	422	0.21
Gasoline Storage Tanks	--	--	--	--	--	--	--	--	--	--	5,680	2.84
Aviation Fuel Storage Tanks	--	--	--	-							42	0.02
Wastewater Treatment Plant	--	--	--	-							39	0.02
Stationary Sources Subtotal	702	0.35	9,447	4.72	11,372	5.69	2,657	1.33	4,468,158	2,234	6,269	3.13
Area Sources												
Woodstoves/Fireplaces	10,320	5.16	120	0.06	775	0.40	75,330	37.67			68,290	34.15
Campfires	30,160	15.08	350	0.17	2,275	1.13	220,200	110.1			199,630	99.82
Wildland Fires	6,315,350	3,158	--	--	--	--	70,734,000	35,370	322,285,688	161,142	3,235,000	1,618
Area Sources Subtotal	6,355,830	3,178	470	0.24	3,050	1.53	71,029,530	35,515	322,285,688	161,142	3,502,920	1,751
Totals												
	Particulates		Sulfur Dioxide		Nitrogen Oxides		Carbon Monoxide		Carbon Dioxide		VOCs	
	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr
Totals without Wildland Fires	41,182	20.59	9,917	4.96	14,422	7.21	298,187	149	4,468,158	2,234	274,190	137.1
Totals with Wildland Fires	6,356,532	3,178	9,917	4.96	14,422	7.21	71,327,717	35,664	326,753,846	163,377	3,777,110	1,886

3. MOBILE SOURCE EMISSIONS

This section summarizes emissions from mobile sources at Grand Teton NP for 2000. Mobile emission sources include highway and nonroad vehicles, including snowmobiles and aircraft operating from the Jackson Hole Airport which is located on park property.

3.1 HIGHWAY VEHICLES

3.1.1 Visitor Vehicles

The number of visitor vehicles operating in NPS units is often correlated to the number of annual visitors to the park unit. Estimated recreational visitors to Grand Teton NP in 2000 were approximately 2,603,000. Assuming a vehicle loading of 2.8 visitors per vehicle, which is typical for large NPS units, the estimated number of recreational vehicles operating in the park in 2000 was 930,000. This correlates reasonably well with traffic volume data developed for a recent transportation study for Grand Teton NP (GRTE 2001). In order to calculate visitor vehicle miles traveled (VMT) for this analysis, visitor vehicles were assumed to operate an average of 60 miles each, which is the approximate one-way, north-south length of the park. VMT for the winter and summer seasons were developed by apportioning the total VMT by the number of recreational visitors for the two periods, and these data are noted in Table 14.

TABLE 14: ESTIMATED VISITOR VEHICLE TRAVEL IN GRAND TETON NP

Season	Recreational Visitors	Visitor Vehicles	Vehicle Miles Traveled
May-Oct	2,289,656	817,734	49,064,060
Nov-Apr	313,412	111,933	6,715,970
Total	2,603,068	929,667	55,780,030

The majority of mobile source emissions can be categorized as either exhaust or evaporative emissions. Exhaust emissions are related to the combustion of fuel in the engine and include VOC, NOx, CO, and PM_{10}. Exhaust emissions are dependent on a number of factors, including engine load, engine design and age, combustion efficiency, emissions equipment such as catalytic converters, and other factors. Evaporative emissions, which can occur while the vehicle is running or at rest, are related to the volatilization of fuel from vapor expansion, leaks and seepage, and fuel tank vapor displacement. Evaporative emissions are primarily dependent on daily temperature cycles and fuel volatility. In addition to vehicle exhaust, PM_{10} emissions also result from brake and tire wear, as well as the re-entrainment of dust from paved and unpaved roads (referred to as fugitive dust).

Emission factors produced by the USEPA *MOBILE6.2* model were used in conjunction with VMT data in order to estimate mobile source emissions for VOC (both exhaust and evaporative), NOx, and CO for visitor vehicles. Similarly, emission factors produced by the PARTS model were used in conjunction with VMT data to estimate PM_{10} emissions. *MOBILE6.2* produces exhaust and evaporative emission factors for the following classes of vehicles: Light Duty Gasoline Vehicles (LDGV), Light Duty Gasoline Trucks 1 (LDGT1), Light Duty Gasoline Trucks 2 (LDGT2), Heavy Duty Gasoline Vehicles (HDGV), Light Duty Diesel Vehicles (LDDV), Light Duty Diesel Trucks (LDDT), Heavy Duty Diesel Vehicles (HDDV), and Motorcycles. It also produces a composite emission factor for all vehicles based on the vehicle VMT mix supplied to the model. Inputs to the model include average vehicle speed, vehicle VMT mix, annual mileage accumulation rates and registration distributions by age, inspection and maintenance (JIM) program information, fuel information, ambient temperature data, and others.

Both the *MOBILE6.2* and *PARTS* models are typically used to support planning and modeling efforts in urban or regional areas and include default inputs suited for these applications. Therefore, it is suitable for applications over large, regional transportation networks. Application of the *MOBILE6.2* model required the utilization of unique inputs that were representative of mobile source activity within the park. In particular, it was necessary to utilize unique inputs for the visitor vehicle VMT mix and the vehicle age distribution. The Center for Environmental Research and Technology within the College of Engineering at the University of California's Riverside Campus (CE-CERT) established park-specific vehicle fleet characterizations in developing air emission inventories for Zion National Park (CE-CERT, 2001). CE-CERT found that the distribution of vehicle ages in the park reflected a larger fraction of newer vehicles compared to the general vehicle population. The park-specific mix vehicle types and vehicle age distribution developed by CE-CERT have been applied in the mobile modeling for Grand Teton NP.

In addition to park-specific age distribution, CE-CERT also developed park-specific modeling inputs for driving patterns that differ significantly from the default driving patterns typically used in mobile modeling, such as the Federal Test Procedure (FTP). In particular, they found that the FTP reflects both higher speeds and a wider range of speeds than observed in national parks. However, since the *MOBILE6.2* model is not designed to readily incorporate unique driving pattern data, the default driving cycle remains the basis for the mobile source emission estimates provided here.

Other important mobile modeling inputs that can significantly affect mobile emission factors are the average speed, fuel characteristics, and I/M program parameters. The average speed input to the mobile model was 35 mph, fuel volatility was assumed to be Reid vapor pressure (RVP) 8.5 (summer) and 13.5 (winter), and reformulated gasoline (RFG) was not assumed to be present. Finally, I/M program inputs were not included since there are no I/M programs in the areas near the park.

In order to account for seasonal differences in mobile emissions, separate *MOBILE6.2* runs were performed to produce emission factors for winter and summer. A composite emission factor for each season, reflecting a park specific VMT mix adapted from CE-CERT, served as the basis for mobile source emission estimates. Additional particulate emissions (or entrained road dust) from vehicles operating on paved roads in Grand Teton NP also were calculated based on VMT.

A summary of visitor vehicle emissions is provided in Table 19 at the end of this section.

3.1.2 **GSAINPS/Concessionaire Highway Vehicles**

Grand Teton NP operates a fleet of highway vehicles that are owned by the NPS or leased from the General Services Administration (GSA), and the principal concessionaires operate fleets of highway vehicles. Although there are inventory lists of the NPS/GSA vehicles, data on their annual operational characteristics were not available. For purpose of this analysis, it was assumed that the light-duty sedans and pick-ups were operated approximately as much as those at other relatively large NPS parks. The concessionaires did not have data available on all vehicles, but they were able to provide estimates of some vehicle miles traveled. A summary of NPS, GSA, and concessionaire vehicles and their estimated annual mileage is provided in Table 15, and emissions are summarized in Table 19 at the end of this section.

3.2 SNOWMOBILES

Most of the Teton Park Road is closed to wheeled vehicles during the winter months, but this road as well as the Continental Divide Snowmobile Trail (CDST) are groomed for use by snowmobilers. The CDST is located immediately adjacent to plowed roads and follows Highway 26-287 from the east park boundary to Moran Junction, where it then follows Highway 89 through the northern section of the park and the John D. Rockefeller, Jr., Memorial Parkway to the south entrance of Yellowstone NP. As part of the development of a *Final Environmental Impact Statement Winter Use Plans* (NPS 2000) and subsequent *Final Supplemental*

Environmental Impact Statement Winter Use Plans (NPS 2003), emissions associated with winter use visitor snowmobiles in Grand Teton NP were estimated.

TABLE 15: NPS, GSA, AND CONCESSIONAIRE ROAD VEHICLES AT GRAND TETON NP

Vehicle Type	Number	Annual Usage (mi/yr)
NPS/GSA		
Light-Duty Gasoline Vehicles/Trucks	142	1,065,000
Heavy Duty Diesel Vehicles	18	45,000
Colter Bay Village		
Light-Duty Gasoline Vehicles/Trucks	N.A.	20,000
Medium Duty Gasoline Trucks	N.A.	35,000
Heavy Duty Diesel Vehicles/Buses	N.A.	70,000
Jackson lake Lodge		
Light-Duty Gasoline Vehicles/Trucks	N.A.	200,000
Medium Duty Gasoline Trucks	N.A.	350,000
Heavy Duty Diesel Vehicles/Buses	N.A.	400,000
Jenny Lake Lodge		
Light-Duty Gasoline Vehicles/Trucks	N.A.	10,500
Medium Duty Gasoline Trucks	N.A.	2,000
Heavy Duty Diesel Vehicles/Buses	N.A.	20,000
Miscellaneous		
Flagg Ranch	5	25,000
Signal Mountain	N.A.	150,000
Triangle X Ranch	22	110,000

N.A. - Not Available

The NPS also operates a fleet of approximately 25 snowmobiles. Since operational data on their average annual use was not readily available, it was assumed that they were operated similarly to those in Yellowstone NP, for which some operational data were available. Emission estimates from both visitor and NPS snowmobiles are provided in Table 19 at the end of this section.

3.3 NPS NONROAD VEHICLES

The NPS also owns and operates nonroad motorized equipment that is used to maintain roads and grounds and for other purposes. There are records of the Grand Teton NP equipment inventory, and the larger pieces of equipment for which there are usage data are noted in Table 16. Annual usage and mission factors from the USEPA nonroad emission database were used to calculate annual emissions that are provided in Table 19.

TABLE 16: NPS NONROAD VEHICLES AT GRAND TETON NP

Vehicle Type	Number	Annual Usage (hrs/yr/each)
Tractors	4	120
Backhoe	3	120
Grader	3	172
Sweeper	3	172
Forklift	3	172
Roller/Compactor	1	80
Loader/Bucket	5	80
Groomer	2	300

3.4 MARINE VESSELS

Motor boats are allowed only on Jackson, Jerry, and Phelps Lakes, although there is no public access to Phelps Lake. On Jenny Lake, the use of motors that exceed 10 horsepower are prohibited, except for authorized concessionaires. Personal watercraft or jet skis are prohibited on all park waters. The NPS operates a fleet of marine vessels, ranging in size from 18 feet to 32 feet, and Amfac Parks & Resorts operates several boats, including a cruise boat that operates on northern Lake Grand Teton. NPS and concessionaire personnel provided information on the vessels and their operating characteristics. Marine equipment and operational data and estimated emissions are summarized in Table 17 for the various boating categories.

3.5 AIRCRAFT

The Jackson Hole Airport is located on the southern end of the park on 568 acres of park land leased by the NPS to the Jackson Hole Airport Board, which operates the commercial airport. Only 26 acres are developed on the site, which is the maximum allowed by the NPS lease agreement. For the 12 month period of June 01, 2000 to May 31, 2001, there were approximately 35,100 aircraft operations or 17,550 landings and takeoffs (an operation is one takeoff or one landing) (Jackson, 2001). These data are further disaggregated according to the types of aircraft, which are summarized in Table 18. These data indicate that approximately 70 percent of all aircraft operations at the airport are attributed to general aviation (GA) aircraft, and commuter and scheduled airline aircraft accounted for 24 and 6 percent of annual flights, respectively.

TABLE 17: GRAND TETON NP MARINE VESSEL EMISSIONS

Marine Vessels	No. of Engines	Engine Power (hp)	Hours of Operation	HC (lb/yr)	CO (lb/yr)	NO_z (lb/yr)	PM (lb/yr)	SO_2 (lb/yr)
National Park Service								
Marinar[1]	1	200	75	103	2,352	52	0	--
Mannar[1]	1	200	75	103	2,352	52	0	--
Mercury[1]	1	200	75	103	2,352	52	0	--
Mannar[1]	1	90	75	47	1,059	23	0	--
Mannar[1]	1	90	75	47	1,059	23	0	--
Honda[1]	1	90	75	47	1,059	23	0	--
MDL 1150E[1]	1	90	75	47	1,059	23	0	--
			Total	497	11,291	248	2	--
Colter **Bay Village**								
Two-Stroke Engines	1	30	980	1,582	3,143	16	105	--
Four-Stroke Engines	1	90	9,800	47,458	94,304	485	3,140	--
			Subtotal	49,040	97,448	501	3,245	
Jackson Lake								
Cruise Boat	1	200	360	3,874	7,698	40	256	--
			Total	53,411	116,437	789	3,503	--

1 Four-stroke gasoline engines
2 Diesel engine

TABLE 18: AIRCRAFT OPERATIONS AT JACKSON HOLE AIRPORT

Category	Representative Aircraft	Annual Activity	
		Operations	**LTOs**
Commuter Turboprop	Shorts 340	8,358	4,179
GA Corporate Jet	Lear 35	7,200	3,600
GA Single Engine	Cessna 150	11,341	5,671
GA Twin Engine	PA-42 Cheyenne	5,840	2,920
B757-200	B757-200	768	384
A319/320	A319/320	942	471
BAE-146	BAE-146	652	326
	Total	35,101	17,551

Criteria emissions from aircraft operations were estimated using the Federal Aviation Administration *Emissions and Dispersion Modeling System (EDMS),* Version 3.23, which is the recommended model for air quality impact assessment for civilian airports. *EDMS* calculates emissions from aircraft based on the aircraft fleet make-up and the airport level of activity expressed as the number of landing and takeoff (LTO) cycles for each aircraft type. The specific inputs to *EDMS* are the aircraft categories, the engine type, and the annual LTO cycles. The emissions of each aircraft type are calculated by multiplying the emission index (pound of pollutant per 1000 pounds of fuel) by the fuel flow rate, the time-in-mode, and the number of engines. The total emissions for each aircraft category is then obtained by multiplying the previous product by the annual number of LTOs and by summing the results over the number of aircraft types.

The *EDMS* also calculates emissions from ground support equipment (GSE) using an operational time profile of each aircraft type and category. GSE may include aircraft tugs, ground power units, belt loaders, baggage tugs, cabin service trucks, and other relatively small motorized equipment. Emissions from both aircraft and GSE operations are provided in Table 19.

3.6 SUMMARY OF MOBILE SOURCE EMISSIONS

Table 19 summarizes the mobile source emissions calculated above in a format that allows comparison between the various sources as well as providing totals for each pollutant or pollutant category under consideration.

TABLE 19: SUMMARY OF 2000 MOBILE SOURCE EMISSIONS AT GRAND TETON NP

Activity	Particulates		Sulfur Dioxide		Nitrogen Oxides		Carbon Monoxide		VOCs	
	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr
Road Vehicles										
Visitor Vehicles	107,248[1]	53.62	--	--	155,359	57.76	2,308,780	1,154	113,021	56.51
NPS/GSA Road Vehicles	2,145[1]	1.07	--	--	3,619	1.81	42,095	21.05	1,938	0.97
Colter Bay Village Concessionaire	280	0.14	--	--	2,710	1.36	3,486	1.74	193	0.10
Jackson Lake Lodge Concessionaire	2,050	1.03	--	--	16,076	8.04	30,541	15.27	1,597	0.80
Jenny Lake Lodge Concessionaire	74	0.04	--	--	760	0.38	794	0.40	45	0.02
Miscellaneous Concessionaires	544	0.27	--	--	526	0.26	11,092	5.55	505	0.25
Road Vehicle Emissions Subtotal	112,341	56.17	--	--	179,050	89.53	2,396,788	1,198	117,299	58.65
Nonroad Vehicles										
Visitor Snowmobiles/Snowcoaches	600	0.3	--	--	200	0.1	94,000	47	36,000	18
NPS Snowmobiles	225	0.11	--	--	72	0.04	25,120	12.56	9,210	4.61
NPS Nonroad Vehicles	727	0.36	--	--	5,120	2.56	2,670	1.33	845	0.42
NPS Marine Vessels	2	<0.01	--	--	248	0.12	11,291	5.65	497	0.25
Concessionaire Marine Vessels	700	0.35	--	--	11,360	4.68	269,400	134.70	11,570	5.79
Jackson Hole Airport Aircraft/GSE	360	0.18	1,506	0.75	47,500	23.75	97,550	48.77	6,870	3.43
Nonroad Vehicle Emissions Subtotal	2,614	1.31	1,506	0.75	64,500	32.25	500,031	250	64,992	32.50
Totals										
Totals	Particulates		Sulfur Dioxide		Nitrogen Oxides		Carbon Monoxide		VOCs	
	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr
	114,955	57.48	1.506	0.75	243,550	121.78	2,896,820	1,448	182,290	91.15

Includes exhaust PM_{10} and road dust

4. GRAND TETON NP AND REGIONAL EMISSIONS

4.1 GRAND TETON NATIONAL PARK SUMMARY

A summary of Grand Teton NP emissions is provided in Table 14.

TABLE 14: ESTIMATED ANNUAL EMISSIONS FROM **GRAND TETON NP**

Source	PM_{10} (tonslyr)	SO_2 (tonslyr)	NO_X (tons/yr)	CO (tons/yr)	VOCs (tonslyr)
Point Sources					
Heating Equipment	0.13	4.35	2.06	0.43	0.04
Generators	0.22	0.37	3.63	0.90	0.21
Gasoline Storage Tanks	--	--	--	--	2.84
Aviation Fuel Storage Tanks	--	--	--	--	0.02
Wastewater Treatment Plant	-	--	--	--	0.02
Subtotal	0.35	4.72	5.69	1.33	3.13
Area Sources					
Woodstoves/Fireplaces	5.16	0.06	0.40	37.67	34.15
Campfires	15.08	0.17	1.13	110.1	99.82
Wildland Fires	3,158	--	--	35,370	1,618
Subtotal	3,178	0.24	1.53	35,515	1,751
Mobile Sources					
Road Vehicles	56.17	--	89.53	1,198	58.65
Nonroad Vehicles	1.31	0.75	32.25	250	32.50
Subtotal	57.48	0.75	121.78	1,448	91.15
Totals					
Totals	3,236	5.71	129.0	36,964	1,845

As methane

4.2 REGIONAL AIR EMISSIONS

Emission estimates for Teton County and the state of Wyoming were obtained from the 1999 National Emission Inventory (NEI) maintained by USEPA. It is important to note that differences may exist between the methodologies used to generate the park emission inventory and those used to generate the NET. For example, here gasoline storage tanks have been included as stationary sources, while the NEI treats them as area sources. It also does not appear that residential wood burning, which accounts for over 90 percent of stationary source PKo emissions in the park, is included as an area source in the NET. Table 20 provides a comparison of Grand Teton NP emissions with those from Teton County and the State of Wyoming.

TABLE 14: ESTIMATED ANNUAL EMISSIONS FROM GRAND TETON NP, SURROUNDING COUNTY, AND THE STATE OF WYOMING

Area	**PM_{10}** (tons/yr)	**SO_2 (tons/yr)**	**NO_X (tons/yr)**	**CO (tons/yr)**	**VOC** (tons/yr)
Point Sources					
Grand Teton NP	0.35	4.72	5.69	1.33	3.13
Teton County	75	2,000	1,152	1,280	1,214
Wyoming	31,308	154,907	142,390	75,072	21,144
Area Sources					
Grand Teton NP	3,178	0.24	1.53	35,515	1,751
Teton County	2,757	24	99	4,359	666
Wyoming	56,195	15,197	61,723	51,368	19,468
Mobile Sources					
Grand Teton NP	57.48	0.75	121.78	1,448	91.15
Teton County	13,406	172	1,821	12,909	2,538
Wyoming	319,935	4,274	71,353	250,450	27,839

5. COMPLIANCE AND RECOMMENDATIONS

5.1 COMPLIANCE

The Wyoming Depaitiuent of Environmental Quality (DEQ) administers air quality regulations in the State of Wyoming. Park personnel should continue to coordinate with the agency on permit issues relating to stationary sources, as well as prescribed burning activities. Prior to replacing or adding relatively large heating units, generators, and fuel storage tanks, the Wyoming DEQ should be consulted regarding the need to obtain a permit to construct or a permit to operate such sources. According to the Wyoming Air Quality Standards and Regulations Chapter 6, Permitting Requirements, stationary fuel burning equipment that has a heat input rating of less than 10 million Btu per hour and mobile internal combustion engines are exempted from these permits.

With respect to ambient air quality standards, Grand Teton NP is located in Teton County, which is designated as attainment for all national and state ambient air quality standards (AAQS), including ozone and particulate matter (PM_{10}).

5.2 ALTERNATIVE FUEL VEHICLE INITIATIVES

The park has initiated a number of alternative fuel vehicle initiatives both in the park and in cooperation with other organizations beginning in the mid-1990s. In August 2002, Grand Teton NP, together with Yellowstone NP, three National Forests, three states, six counties, seven cities and towns, and dozens of private businesses, were formally designated as the Greater Yellowstone-Teton Clean Cities Coalition by the U.S. Department of Energy (DOE). This designation foiinally unites the Coalition and the DOE and provides for mutual agreements, responsibilities, and procedures necessary to carry out the objectives of the DOE Clean Cities program, as guided by the Energy policy Act of 1992 and the Clean Air Act Amendments of 1990. The immediate goal of the Coalition is to expand alternative fuel infrastructure and alternative fuel vehicle use in the region.

Additional alternative fuel and clean engine initiatives include:

- The park has been conducting a pilot project with a propane-fueled truck from Idaho Falls.
- El0 gasoline (10 percent ethanol/90 percent gasoline that is also known as gasohol) has been sold at all public gasoline service stations in the park since April 2001.
- El0 gasoline is provided for rental cars at the Jackson Hole Airport, which is located within the park boundaries.

- Pa~lnership with Yellowstone NP, Montana, Wyoming, Idaho, USEPA, and SAE International to support annual Clean Snowmobile Challenge.

In the summer of 2002, a 20 percent rapeseed/80 percent diesel fuel, referred to as B20 and biodiesel, will be used for its administrative fleet. Grand Teton also has completed a transportation planning effort that is directed at expanding mass transit and other forms of low impact transportation modes within the park, including bicycling and walking (Grand Teton NP 2001).

5.3 RECOMMENDATIONS

Of the park's stationary air emission sources, residential woodstoves are estimated to be the largest emitters. Park officials are aware of this issue and have discussed measures that include woodstove removal, phase-out, andlor replacement with units that meet USEPA New Source Performance Standards for residential woodstoves. In recent years, the park has switched from No. 2 fuel oil to cleaner burning propane as heating equipment is replaced. Both of these measures should continue to be aggressively pursued.

The continuing use of snowmobiles operating in the park has been the subject of litigation and resulting environmental impact studies. In the most recent Final Supplemental Environmental Impact Statement (FSEIS) for Winter Use in Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr., Memorial Parkway (NPS 2003), the NPS notes that the preferred alternative in the FSEIS strikes a balance between phasing out all snowmobile use-as required under the November 2000 Record of Decision-and allowing for the unlimited snowmobile use of the past. Critical elements of the preferred alternative include: reduced numbers of snowmobiles through daily limits; implementing best available technology requirements for snowmobiles; implementation of an adaptive management program; guided access for both snowmobiles and snowcoaches; a reasonable phase-in period; a new generation of snowcoaches; and funding to effectively manage the winter use program.

Two-stroke engine marine vessels contribute the significant proportion of CO and VOC emissions from nonroad vehicles operating in the park. Replacement of these vessels with new, lower emission four-stroke engine models should reduce emissions considerably. This would include an accelerated replacement schedule for park and concessionaire-owned vessels and development of an outreach public education program to encourage the public to phase-out two-stroke engine technology.

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APPENDIX A

FUEL DATA AND EMISSION FACTORS

FUEL DATA

Fuel	Heating Value	Sulfur Content
No. 2 Distillate Fuel Oil/Diesel	140,000 Btu/gal	0.05% by weight
Natural Gas	1,050 Btu/ft^3	2,000 grains/10^6 ft^3
Propane	91,500 Btu/gal	0.18 grains/100 ft^3

STATIONARY SOURCE EMISSION FACTORS - BOILERS/HEATING UNITS

DISTILLATE OIL (DF-2) - CRITERIA POLLUTANTS					
Combustor Type	Emission Factor (lb/1,000 gal fuel burned)				
	PM[a]	SOP)	NO_x te)	CO	VOC[d]
Residential Furnace`)	0.4	1425	18	5	0.713
Boilers < 100 Million Btu/hr (Commercial/Institutional Combust()	2	142S	20	5	0.34
Boilers < 100 Million Btu/hr (Industrial Boilers [s])	2	142S	20	5	0.2
Boilers > 100 Million Btu/hr (Utility Boilers[h])	2	157S	24	5	--
Source: AP-42, 5th Edition, Supplements A, B, C, D, and E, Tables 1.3-1 and 1.3-3.					

NATURAL GAS - CRITERIA POLLUTANTS					
Combustor Type (MMBtu/hr Heat Input)	Emission Factor (lb/10^6 ft^3 fuel burned)				
	PM[0)]	SO_2	NO,,(')	CO	VOC
Residential Furnaces (<0.3)					
-Uncontrolled	7.6	0.6	94	40	5.5
Tangential-Fired Boilers (All Sizes)					
-Uncontrolled	7.6	0.6	170	24	5.5
-Controlled-Flue gas recirculation	7.6	0.6	76	98	5.5
Small Boilers (<100)					
-Uncontrolled	7.6	0.6	100	84	5.5
-Controlled-Low NO_x burners	7.6	0.6	50	84	5.5
-Controlled-Low NO_x burners/Flue gas recirculation	7.6	0.6	32	84	5.5
Large Wall-Fired Boilers (>100)					
-Uncontrolled (Pre-NSPS) [k]	*7.6*	*0.6*	280	84	5.5
-Uncontrolled (Post-NSPS) [k]	*7.6*	*0.6*	190	84	5.5
-Controlled-Low NO_x burners	7.6	0.6	140	84	5.5
-Controlled-Flue gas recirculation	*7.6*	*0.6*	100	84	5.5
Source: AP-42, 5th Edition, Supplements A, B, C, D, and E, Tables 1.4-1 and 1.4-2.					

STATIONARY SOURCE EMISSION FACTORS - BOILERS/HEATING UNITS (Continued)

PROPANE (LPG) - CRITERIA POLLUTANTS					
Combustor Type	Emission Factor (lb/1,000 gal fuel burned)				
	PM [a]	SO_2 [b]	NO_X [c]	CO	VOC [d]
Commercial Boilers [f]	0.4	0.1OS	14	1.9	0.3
Industrial Boilers [s]	0.6	0.10S	19	3.2	0.3
Source: AP-42, 5th Edition, Supplements A, B, C, D, and E, Table 1.5-I.					

STATIONARY SOURCE EMISSION FACTORS - GENERATORS

For generators rated at less than or equal to 448 kW (600 hp):

Fuel Type	Emission Factor (lb/hp-hr)				
	PM	SO_X	NO_X	CO	VOC
DF-2	2.20 E-03	2.05 E-03	0.031	6.68 E-03	2.51 E-03
Gasoline	7.21 E-04	5.91 E-04	0.011	0.439	0.022
Natural Gas/Propane	1.54 E-04	7.52 E-03(S)	3.53 E-03	8.6 E-04	1.92 E-04
Source: AP-42, 5th Edition, Supplements A, B, C, D, and E, Table 3.3-1 and 3.1-1					

For generators rated at greater than 448 kW (600 hp):

Fuel Type	Emission Factor (lb/hp-hr)				
	PM	SO_X [b]	NO,,	CO	VOC
DF-2	0.0007	(8.09 E-03)S	0.024	5.5 E-03	6.4 E-04
Source: AP-42, 5th Edition, Supplements A, B, C, D, and E, Table 3.4-1.					

FIREPLACE EMISSION FACTORS

Fuel Type	Emission Factor (lb/ton)				
	PM°)	SO_X	NO,(r)	CO	VOC
Wood	34.6	0.4	2.6	252.6	229.0
Source: AP-42, 5th Edition, Supplements A, B, C, D, and E, Table 1.9-1.					

WOODSTOVE EMISSION FACTORS

Stove Type	Emission Factor (lb/ton)				
	PM^{0}	SO_x	NO_x (`)	CO	VOC
Conventional	30.6	0.4	2.8	230.8	53
Noncatalytic	19.6	0.4	--	140.8	12
Catalytic	20.4	0.4	2.0	104.4	15

Source: AP-42, 5th Edition, Supplements A, B, C, D, and E, Table 1.10-I.

STATIONARY SOURCE EMISSION FACTORS - SURFACE COATING OPERATIONS

Surface Coating Type	VOC Emission Factor (lb/gal)
Paint: Solvent Base	5.6
Paint: Water Base	1.3
Enamel: General	3.5
Lacquer: General	6.1
Primer: General	6.6
Varnish/Shellac: General	3.3
Thinner: General	7.36
Adhesive: General	4.4

Source: *Calculation Methods for Criteria Air Pollutant Emission Inventories,* AL/OE-TR-1994-0049, July 1994. Armstrong Laboratory.

(a) PM = Filterable Particulate Matter.
(b) These factors must be multiplied by the fuel sulfur content (for example, if the sulfur content is 0.05%, then S equals 0.05).
(c) Expressed as NO_2.
(d) Emission factors given in AP-42 are actually for non-methane total organic compounds (NMTOC) which includes all VOCs and all exempted organic compounds (such as ethane, toxics and HAPs, aldehydes and semivolatile compounds) as measured by EPA reference methods.
(e) Unit Rating <300,000 Btu/hr.
(f) Unit Rating 3300,000 Btu/hr, but <10,000,000 Btu/hr.
(g) Unit Rating 310,000,000 Btu/hr, but <100,000,000 Btu/hr.
(h) Unit Rating 3100,000,000 Btu/hr.
(i) POM = Particulate POM only.
(j) PM = Filterable Particulate Matter + Condensible Particulate Matter.
(k) NSPS = New Source Performance Standard as defined in 40 CFR 60 Subparts D and Db. Post-NSPS units are boilers with greater than 250 MMBtu/hr of heat input that commenced construction, modification, or reconstruction after August 17, 1971, and units with heat input capacities between 100 and 250 MMBtu/hr that commenced construction, modification, or reconstruction after June 19, 1984.
(1) Emission factors are given on a fuel input basis (lb/MMBtu). To convert to a power output basis (lb/hp-hr), use an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr.

APPENDIX B

EMISSION CALCULATIONS

2000 ACTUAL CRITERIA EMISSIONS FROM HEATING UNITS AT GRAND TETON NATIONAL PARK

Emission Source	Location	Fuel	Number of Sources	Capacity (Btu/hr)		Consumption (eal/vr)	PM_{10} (lbs/vr)	SO_2 Ms/yr)	NOx (lbs/vr)	CO (lbs/vr)	CO_2 (lbs/vr)	VOC (lbs/yr)
				National Park Service								
Boiler	Moose Visitor Center	No. 2 Fuel Oil	1	1,700,000	1,700,000	6,828	14	485	137	34	146,802	2
Boiler	Moose Maintenance Building	No. 2 Fuel Oil	2	1,688,000	3,376,000	13,560	27	963	271	68	291,532	5
Furnace	Coulter Bay Upper Laundry	No. 2 Fuel Oil	1	125,000	125,000	502	0	36	9	3	10,794	0
Furnace	Coulter Bay Lower Laundry	No. 2 Fuel Oil	1	125,000	125,000	502	0	36	9	3	10,794	0
Fumace	Beaver CreekEmployee Housing	No. 2 Fuel Oil	4	125,000	500,000	2,008	1	143	36	10	43,177	1
		Totals	9	3,763,000		23,400	42	1,661	462	117	503,100	9
Emission Factors from AP-42, Tables 1.3-I and 1.3-3 for residential furnaces (<300,000 Btu/hr), S = 0.5 percent							0.4	142S	18.0	5.0	21,500	0.7
Emission Factors from AP-42, Tables 1.3-I and 1.3-3 for furnaces (>300,000 Btu/hr), S = 0.5 percent							2.0	142S	20.0	5.0	21,500	0.3
Fonnula = Consumption (gallyr) * Emission Factor (lb/1,000 gal)												
				National Park Service		_						
Boiler	Coulter Bay Visitor Center	Propane	1	1,700,000	1,700,000	9,214	4	0	129	18	115,179	3
Ceiling Heater	Coulter Bay Auto Shop	Propane	2	200,000	400,000	2,168	1	0	30	4	27,101	1
Floor Heaters	Coulter Bay Auto Shop	Propane	1	200,000	200,000	1,084	0	0	15	2	13,550	0
Heater	Moran Entrance Station	Propane	1	80,000	80,000	434	0	0	6	1	5,420	0
		Totals	5			12,900	5	0	181	25	161,250	4
				Employee Housing								
Furnace	Employee Housing	Propane	58	80,000	4,640,000	33,640	13	1	471	64	420,500	10
		Totals	72			46,540	19	1	652	88	581,750	14
Emission Factors from AP-42, Tables 1.5-1 for commercial boilers S = 0.18 grains/100 cu ft							0.4	0.1 *S	14.00	1.90	12,500	0.30
Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)												
		Total Heating Units	81			69,940	61	1662	1114	205	1,084,850	231

Emission Source	Location	Fuel	Number of Sources	Capacity (Btu/hr)		Consumption (gal/yr)	PM_{10} Ohs/yr)	SO_2 (Ibs/yr)	NOx (Ibs/yr)	CO (Ibs/yr)	CO_2 (lbs/yr)	VOC (Ibs/yr)
				Jackson Lake Lodge								
Boiler	Dorm 13	No. 2 Fuel Oil	1	390,000	390,000	5,000	10	355	100	25	107,500	2
Boiler	Main Lodge	No. 2 Fuel Oil	1	8,296,000	8,296,000	70,000	140	4,970	1,400	350	1,505,000	24
		Totals	2	8,686,000		75,000	150	5,325	1,500	375	1,612,500	26
Emission Factors from AP-42, Tables 1.3-1 and 1.3-3 for residential furnaces (<300,000 Btu/hr), S = 0.5 percent							0.4	1425	18.0	5.0	21,500	0.7
Emission Factors from AP-42, Tables 1.3-1 and 1.3-3 for fumaces (>300,000 Btu/hr), S = 0.5 percent							2.0	1425	20.0	5.0	21,500	0.3
Formula = Consumption (gal/yr) * Emission Factor (lb/ 1,000 gal)												
				Jackson Lake Lodge								
Furnace	General Manager House	Propane	2	90,000	180,000	500	0	0	7	I	6,250	0
Boiler	900 Building	Propane	1	1,350,000	1,350,000	2,500	1	0	35	5	31,250	1
Furnace	Main Lodge	Propane	2	400,000		14,350	6	0	201	29	179,375	4
Fumace	Service Station	Propane	1	200,000		350	0	0	5	1	4,375	0
Furnace	Staff Housing	Propane	12	300,000		4,500	2	0	63	9	56,250	1
Furnace	Employee Lounge	Propane	2	200,000		4,000	2	0	56	8	50,000	1
Kitchen Equipment	Employee Kitchen	Propane	3	Unkown		7,500	3	0	105	15	93,750	2
Water Heater	Staff Housing	Propane	9	150,000		750	0	0	11	2	9,375	0
Kitchen Equipment	Pool Kitchen	Propane	4	Unkown		3,500	1	0	49	7	43,750	1
		Totals	36			37,950	15	1	531	76	474,375	II
		Total Heating Units	38				165	5,326	2,031	451	2,086,875	37
Emission Factors from AP-42, Tables 1.5-I for commercial boilers S = 0.18 grains/100 cu ft							0.40	0.1 *S	14.00	1.90	12,500	0.30
Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)												

Emission Source	Location	Fuel	Number of Sources	Capacity (Btu/hr)		Consumption (Qal/vr)	PM_{10} (Ibs/yr)	SO_2 (Ibs/yr)	NOx (lbs/vr)	CO (lbs/vr)	CO_2 (Ibs/yr)	VOC (Ibs/yr)
				Colter Bay Village								
Boiler	Chuckwagon	No. 2 Fuel Oil	1	1,900,000	1,900,000	12,000	5	852	216	6U	258,000	9
Boiler	Laundrette	No.2 Fuel Oil	1	1,800,000	1,800,000	8,100	3	575	146	41	174,150	6
		Totals	2	3,700,000		20,100	8	1,427	362	101	432,150	14
Emission Factors from AP-42, Tables 1.3-1 and 1.3-3 for furnaces (>300,000 Btu/hr), S = 0.5 percent							2.0	I42S	20.0	5.0	21,500	0.3
Formula = Consumption (gal/yr) * Emission Factor (lb/ 1,000 gal)												
				Colter Bay Village								
Boiler	Cbv Dorms	Propane	1	500,000	500,000	2,5uu	1	0	35	5	31,250	
		Totals	1			2,500	1	0	35	5	31,250	1
		Total Heating Units	3									
Emission Factors from AP-42, Tables 1.5-1 for commercial boilers S = 0.18 grains/100 cu ft							0.40	0.1 *S	14.00	1.90	12,500	0.30
Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)												

				fenny Lake Lodge								
Boiler	Lodge	Propane		850,000	1,700,000	2,500			35		31,250	
		Totals				2,500			35		31,250	
Emission Factors from AP-42, Tables 1.5-1 for commercial boilers S = 0.18 grains/100 cu ft Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)							0.40	0.1 *S	14.00	1.90	12,500	0.30
				Flagg Ranch Resort								
Furnace	Lodge	Propane	8	150,000	1,200,000	2,000	1	0	28	4	25,000	
Furnace	Cabins	Propane	48	25,000	1,200,000	5,000	2	0	70	10	62,500	2
Water Heater	Cabins	Propane	48	40,000		2,500	1	0	35	5	31,250	1
Water Heater	Lodge	Propane	2	200,000		1,000	0	0	14	2	12,500	0
Water Heater	Maintenance/Laundry	Propane	3	200,000		1,500	1	0	21	3	18,750	0
		Totals	109			12,000	5	0	168	24	150,000	4
		Total Heating Units	109									
Emission Factors from AP-42, Tables 1.5-1 for commercial boilers S = 0.18 grains/100 Cu ft Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)							0.40	0.1 *S	14.00	1.90	12,500	0.30
				'triangle X Ranch								
Furnace	Cabins	Propane	52	100,000	5,200,000	20,966	8	0	294	42	262,075	6
		Totals	52			20,966	8	0	294	42	262,075	6
		Total Heating Units	52									
Emission Factors from AP-42, Tables 1.5-1 for commercial boilers S = 0.18 grains/100 cu ft Fonnula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)							0.40	0.1 *S	14.00	1.90	12,500	0.30
Emission Source	Location	Fuel	Number of Sources	Capacity (Btu/hr)		Consumption (gallvr)	PM (lbs/yr)	SO_2 (lbs/yr)	NOx (lbs/yrl	CO (lbs/vrl	CO_2 (lbs/yr)	VOC (lbs/yr)
				Jackson **Hole Airport**								
Boiler	Control Tower	No. 2 Fuel Oil	2	800,000	1,600,000	4,000	is	284	80	20	86,000	
		Totals	2	800,000		4,000	8	284	80	20	86,000	
Emission Factors from AP-42, Tables 1.3-1 and 1.3-3 for furnaces (>300,000 Btu/hr) S = 0.5 percent Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)							2.0	142S	20.0	5.0	21,500	0.3
						Totals	257	8,700	4,118	853	4,164,450	87

No. 2 Fuel Oil (gal)	122,500
Propane (gal)	122,456

2000 POTENTIAL CRITERIA EMISSIONS FROM HEATING UNITS AT GRAND TETON NATIONAL PARK

Emission Source	Location	Fuel	Number of Sources	Capacity (Btu/hr)		Consumption (gal/yr)	PM_{10} (Ibs/yr)	SO_2 (Ibs/yr)	NO_X (ibs/yr)	CO (Ibs/yr)	CO, (Ibs/yr)	VOC (Ibs/yr)
				National Park Service								
Boiler	Moose Visitor Center	No.2 Fuel Oil	1	1,700,000	1,700,000	106,371	213	7,552	2,127	532	2,286,986	36
Boiler	Moose Maintenance Building	No. 2 Fuel Oil	2	1,688,000	3,376,000	211,241	422	14,998	4,225	1,056	4,541,685	72
Furnace	Coulter Bay Upper Laundry	No. 2 Fuel Oil	1	125,000	125,000	7,821	3	555	141	39	168,161	6
Furnace	Coulter Bay Lower Laundry	No. 2 Fuel Oil	1	125,000	125,000	7,821	3	555	141	39	168,161	6
Furnace	Beaver CreekEmployee 1-lousing	No. 2 Fuel Oil	4	125,000	500,000	31,286	13	2,221	563	156	672,643	22
		Totals	9	3,763,000		364,541	654	25,882	7,197	1,823	7,837,635	141
Emission Factors from AP-42, Tables 1.3-1 and 1.3-3 for residential furnaces (<300,000 Btu/hr), S = 0.5 percent							0.4	142S	18.0	5.0	21,500	0.7
Emission Factors from AP-42, Tables 1.3-1 and 1.3-3 for furnaces (>300,000 Btu/hr), S = 0.5 percent							2.0	1425	20.0	5.0	21,500	0.3
Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)												
				National Park Service								
Boiler	Coulter Bay Visitor Center	Propane	1	1,700,000	1,700,000	162,754	65	3	2,279	326	2,034,426	49
Ceiling Heater	Coulter Bay Auto Shop	Propane	2	200,000	400,000	38,295	15	1	536	77	478,689	11
Floor Heaters	Coulter Bay Auto Shop	Propane	1	200,000	200,000	19,148	8	0	268	38	239,344	6
Heater	Moran Entrance Station	Propane	1	80,000	80,000	7,659	3	0	107	15	95,738	2
		Totals	5			227,856	91	4	3,190	456	2,848,197	68
				Em lovee nonsliP,								
Furnace	Employee Housing	Propane	58	80,000	4,640,000	444,223	178	8	6,219	888	5,552,787	133
		Totals	72			672,079	269	12	9,409	1,344	8,400,984	202
Emission Factors from AP-42, Tables 1.5-1 for commercial boilers S = 0.18 grains/100 cu ft							0.4	0.1 *S	14.00	1.90	12,500	0.30
Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)												
		Total Heating Units	81			1,036,620	923	25,895	16,606	3,167	16,238,618	343

Emission Source	Location	Fuel	Number of Sources	Capacity (Btu/hr)		Consumption (gallyr)	PM_{10} (lbs/yr)	SO_2 (Ibs/yr)	NO_X (lbs/vr)	CO (Ibs/yr)	CO, (Ibs/yr)	VOC (Ibs/yr)
				Jackson **Lake** Lodge								
Boiler	Donn 13	No. 2 Fuel Oil	1	390,000	390,000	24,403	49	1,733	488	122	524,661	8
Boiler	Main Lodge	No. 2 Fuel Oil	1	8,296,000	8,296,000	519,093	1,038	36,856	10,382	2,595	11,160,490	176
		Totals	2	8,686,000		543,495	1,087	38,588	10,870	2,717	11,685,152	185
Emission Factors from AP-42, Tables 1.3-1 and 1.3-3 for residential furnaces (<300,000 Btu/hr), S = 0.5 percent							0.4	142S	18.0	5.0	21,500	0.7
Emission Factors from AP-42, Tables 1.3-1 and 1.3-3 for furnaces (>300,000 Btu/hr), S = 0.5 percent							2.0	142S	20.0	5.0	21,500	0.3
Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)												
				Jackson **Lake** Lodge								
Furnace	General Manager House	Propane	2	90,000	180,000	17,233	7	0	241	34	215,410	5
Boiler	900 Building	Propane	1	1,350,000	1,350,000	129,246	52	2	1,809	258	1,615,574	39
Furnace	Main Lodge	Propane	2	400,000	800,000	76,590	31	1	1,072	153	957,377	23
Furnace	Service Station	Propane	1	200,000	200,000	19,148	8	0	268	38	*239,344*	*6*
Furnace	Staff Housing	Propane	12	300,000	3,600,000	344,656	138	6	4,825	689	4,308,197	103
Furnace	Employee Lounge	Propane	2	200,000	400,000	38,295	15	1	536	77	478,689	11
Kitchen Equip	Employee Kitchen	Propane	3	100,000	300,000	28,721	11	1	402	57	359,016	9
Water Heater	Staff Housing	Propane	9	150,000	1,350,000	129,246	52	2	1,809	258	1,615,574	39
Kitchen Equip	Pool Kitchen	Propane	4	100,000	400,000	38,295	15	1	536	77	478,689	11
		Totals	36			821,430	329	15	11,500	1,643	10,267,869	246
		Total Heating Units	38				1,416	38,603	22,370	4,360	21,953,021	431
Emission Factors from AP-42, Tables 1.5-1 for commercial boilers S = 0.18 grains/100 cu ft							0.40	0.1 *S	14.00	1.90	12,500	0.30
Formula = Consumption (gaUyr) * Emission Factor (lb/1,000 gal)												

Emission Source	Location	Fuel	Number of Sources	Capacity (Btu/hr)		Consumption (gal/yr)	PM_{10} (Ibs/yr)	SO_2 (Ibs/yr)	NO_X (lbs/yr)	CO (lbs/yr)	CO, (Ibs/yr)	VOC (Ibs/yr)
				Colter Bay Village								
Boiler	Chuckwagon	No. 2 Fuel Oil	1	1,900,000	1,900,000	118,886	48	8,441	2,140	594	2,556,043	85
Boiler	Laundrette	No. 2 Fuel Oil	1	1,800,000	1,800,000	112,629	45	7,997	2,027	563	2,421,514	80
		Totals	2	3,700,000		231,514	93	16,438	4,167	1,158	4,977,557	165
Emission Factors from AP-42, Tables 1.3-1 and 1.3-3 for furnaces (>300,000 Btu/hr), S = 0.5 percent							2.0	142S	20.0	5.0	21,500	0.3
Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)												
				Colter Bay Village								
Boiler	Cbv Dorms	Propane	1	500,000	500,000	47,869	19	1	670	96	598,361	14
		Totals	1			47,869	19	1	670	96	598,361	14
		Total Heating Units	3									
Emission Factors from AP-42, Tables 1.5-1 for commercial boilers S = 0.18 grains/100 cu ft							0.40	0.1*S	14.00	1.90	12,500	0.30
Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)												

				Jenny Lake Lodge								
Boiler	Lodge	Propane	2	850,000	1,700,000	162,754	65	3	2,279	326	2,034,426	49
		Totals	2			162,754	65	3	2,279	326	2,034,426	49
Emission Factors from AP-42, Tables 1.5-1 for commercial boilers S = 0.18 grains/100 cu ft							0.40	0.1 *S	14.00	1.90	12,500	0.30
Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)												

				Flagg Ranch Resort								
Furnace	Lodge	Propane	8	150,000	1,200,000	114,885	46	2	1,608	230	1,436,066	34
Furnace	Cabins	Propane	48	25,000	1,200,000	114,885	46	2	1,608	230	1,436,066	34
Water Heater	Cabins	Propane	48	40,000	1,920,000	183,816	74	3	2,573	368	2,297,705	55
Water Heater	Lodge	Propane	2	200,000	400,000	38,295	15	1	536	77	478,689	11
Water Heater	Maintenance/Laundry	Propane	3	200,000	600,000	57,443	23	1	804	115	718,033	17
		Totals	109			509,325	204	9	7,131	1,019	6,366,557	153
		Total Heating Units	109									
Emission Factors from AP-42, Tables 1.5-1 for commercial boilers S = 0.18 grains/100 cu ft Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)							0.40	0.1 *S	14.00	1.90	12,500	0.30

				Triangle X Ranch								
Furnace	Cabins	Propane	52	100,000	5,200,000	497,836	199	9	6,970	996	6,222,951	149
		Totals	52			497,836	199	9	6,970	996	6,222,951	149
		Total Heating Units	52									
Emission Factors from AP-42, Tables 1.5-1 for commercial boilers S = 0.18 grains/100 cu ft Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)							0.40	0.1 *S	14.00	1.90	12,500	0.30

Emission Source	Location	Fuel	Number of Sources	Capacity (Btu/hr)		Consumption (pal/yr)	PM$_{1 p}$ (Ibs/yr)	SO_2 (Ibs/yr)	NOx (Ibs/yr)	CO (Ibs/yr)	CO_2 (lbs/yr)	VOC (lbs/vrl
				Jackson Hole Airport								
Boiler	Control Tower	No. 2 Fuel Oil	2	800,000	1,600,000	100,114	200	7,1u8	2,002	501	2,152,457	34
		Totals	2	800,000		100,114	200	7,108	2,002	501	2,152,457	34
Emission Factors from AP-42, Tables 1.3-1 and 1.3-3 for furnaces (>300,000 Btu/hr), S = 0.5 percent Formula = Consumption (gallyr) * Emission Factor (lb/1,000 gal)							2.0	142S	20.0	5.0	21,500	0.3

Totals	3,118	88,065	62,195	11,621	60,543,948	1,339	

No. 2 Fuel Oil (gal) 1,239,665

Propane (gal) 2,213,456

2000 ACTUAL CRITERIA EMISSIONS FROM GENERATORS AT GRAND TETON NATIONAL **PARK**

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PM_{10} (lbs/yr)	SO_2 (Ibs/yr)	NO_x (Ibs/yr)	CO (Ibs/yr)	CO_2 (Ibs/yr)	VOC (Ibs/yr)
National Park Service												
Generator	Moose Visitor Center	Diesel	1	125	52	6,500	I9	18	270	58	10,017	22
Generator	Moose Maintenance	Diesel	1	300	52	15,600	46	43	648	140	24,040	52
Generator	Coulter Bay Visitor Center	Diesel	1	60	52	3,120	9	9	130	28	4,808	10
Generator	Coulter Bay Lift Station	Diesel	t	40	52	2,080	6	6	86	19	3,205	7
Generator	Jenny Lake	Diesel	1	40	52	2,080	6	6	86	19	3,205	7
	Diesel Generator Totals		5		260	29,380	87	81	1,220	263	45,275	99
Emission Factors from AP-42, Chapter 3.3 Table 3.3-1 for diesel generators rated less than 448 kW							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51E-03
Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)												

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PM_{10} (lbs/yr)	SO_2 (Ibs/yr)	NO, (lbs/yr)	CO (Ibs/yr)	CO_2 (Ibs/yr)	VOC (lbs/yr)
Jackson Lake Lodge												
Generator	Main Lodge	Diesel	1	500	65	32,500	96	176	1,045	240	50,083	28
Generator	Main Lodge	Diesel	1	360	65	23,400	22	64	753	172	36,059	20
	Diesel Generator Totals		2		130	55,900	118	240	1,798	412	86,142	48
Emission Factors from AP-42, Chapter 3.3 Table 3.3-1 for diesel generators rated less than 448 kW							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51E-03
Emission Factors from AP-42, Chapter 3.4-1 for diesel generators rated greater than 448 kW, S = 0.5 percent							7.00E-04	0.00809*S	2.40E-02	5.50E-03	1.15E+00	6.40E-04
Fonnula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)												
Generator	Main Lodge	Gasoline	1	5	25	125	0	0	2	74	181	4
	Gasoline Generator Totals		1		25	125	0	0	2	74	181	4
Emission Factors from AP-42, Chapter 3.4-1 for generators rated less than 448 kW, S=.05							7.10E-04	5.91 E-04	1.10E-02	4.39E-01	1.08E+00	2.20E-02
Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)												
	All Generator Totals		3		155	56,025	118	241	1,800	486	86,323	521

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PM_{10} (lbs/yr)	SO_2 (lbs/yr)	NO_x (lbs/yr)	CO (lbs/yr)	CO_2 (lbs/yr)	VOC (lbs/yr)
						Coulter Bay Village						
Generator	Main Lodge	Diesel	1	200	60	12,000	35	33	498	107	18,492	40
Generator	Grocery Store	Diesel	1	250	60	15,000	44	41	623	134	23,115	50
Generator	Laundrette	Diesel	1	75	60	4,500	13	12	187	40	6,935	15
	Diesel Generator Totals		3		180	31,500	93	87	1,309	282	48,542	106
Emission Factors from AP-42, Chapter 3.3 Table 3.3-1 for diesel generators rated less than 448 kW Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51E-03
Generator	Cabin Office	Gasoline	1	5	40	200	0	0	3	118	289	6
	Gasoline Generator Totals		1		40	200	0	0	3	118	289	6
Emission Factors from AP-42, Chapter 3.4-1 for generators rated less than 448 kW, S=.05 Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)							7.10E-04	5.91E-04	1.10E-02	4.39E-01	1.08E+00	2.20E-02
	All Generator Totals		4		220	31,700	93	87	1,311	400	48,831	1121

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PM_{10} (lbs/yr)	SO_2 (lbs/yr)	NO_x (lbs/yr)	CO (lbs/yr)	CO_2 (lbs/yr)	VOC (lbs/yr)
						Jenny Lake Lodge						
Generator	Main Lodge	Diesel	1	200	60	12,000	35	33	498	107	18,492	40
	Diesel Generator Totals		1		60	12,000	35	33	498	107	18,492	40
Emission Factors from AP-42, Chapter 3.3 Table 3.3-1 for diesel generators rated less than 448 kW Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51E-03

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/vr)	Output (kW-hr/yr)	PM_{10} (lbs/yr)	SO_2 (lbs/yr)	NO_x (lbs/yr)	CO (lbs/yr)	CO_2 (lbs/yr)	VOC (lbs/yr)
						Flagg Ranch Resort						
Generator	Lower Flagg	Diesel	1	500	25	12,500	12	68	402	92	19,263	11
Generator	Upper Flagg	Diesel	1	400	25	10,000	29	27	415	90	15,410	34
	Diesel Generator Totals		2		50	22,500	41	95	817	182	34,673	44
Emission Factors from AP-42, Chapter 3.3 Table 3.3-1 for diesel generators rated less than 448 kW							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51 E-03
Emission Factors from AP-42, Chapter 3.4-1 for diesel generators rated greater than 448 kW, S = 0.5 percent							7.00E-04	0.00809*S	2.40E-02	5.50E-03	1.15E+00	6.40E-04
Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (Ib/hp-hr)												

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PM_{10} (lbs/yr)	SO_2 (lbs/yr)	NO_x (lbs/yr)	CO (lbs/yr)	CO_2 (lbs/yr)	VOC (lbs/yr)
Jackson Hole Airport												
Generator	FAA/VOR	Propane	1	30	52	1,560	0	3	7	2		0
	Propane Generator Totals		1	30	52	1,560	0	3	7	2		0
Emission Factors from AP-42, Chapter 3.1-1 for natural gas/propane (lb/hp-hr), 5=.18							1.54E-04	7.52E-03*S	3.53E-03	8.60E-04		1.92E-04
Formula = Emission Factor (lb/hp-hr) * 608 (g/kW-hr / lb/hp-hr) * Output (kW-hr/yr) / 453.6 (glib)												
Generator	Tenninal	Diesel	1	600	52	31,200	29	169	1,003	230	48,079	27
Generator	Tower	Diesel	1	50	52	2,600	8	7	108	23	4,007	9
Generator	Tower	Diesel	1	25	52	1,300	4	4	54	12	2,003	4
	Diesel Generator Totals		3		156	35,100	41	180	1,165	265	54,089	40
Emission Factors from AP-42, Chapter 3.4-1 for generators rated less than 448 kW							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51E-03
Emission Factors from AP-42, Chapter 3.4-1 for diesel generators rated greater than 448 kW, S=0.5 percent							7.00E-04	0.00809*S	2.40E-02	5.50E-03	1.15E+00	6.40E-04
Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)												
	All Generator Totals		4		208	36,660	41	183	1,173	267	54,089	401

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PM_{10} (lbs/yr)	SO_2 (lbs/yr)	NO_x (lbs/yr)	CO (lbs/yr)	CO_2 (lbs/yr)	VOC (lbs/yr)
Jackson Lake Dam, Bureau of Reclamation												
Generator	Shop/Residence	Diesel	1	200	52	10,400	31	29	432	93	16,026	35
	Diesel Generator Totals		1		52	10,400	31	29	432	93	16,026	35
Emission Factors from AP-42, Chapter 3.3 Table 3.3-1 for diesel generators rated less than 448 kW							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51E-03
Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)												

	PM_{10}	SO_2	NO_x	CO	CO_2	VOC
Park Totals (lbs/yr)	446	747	7,252	1,797	303,708	422
Park Totals (tons/yr)	0.22	0.37	3.63	0.90	151.85	0.21

2000 POTENTIAL CRITERIA EMISSIONS FROM GENERATORS AT GRAND TETON NATIONAL PARK

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PMro (Ibs/yr)	SO_2 (lbs/yr)	NO_x (Ibs/yr)	CO (lbs/yr)	CO_2 (Ibs/yr)	VOC (Ibs/yr)
National Park Service												
Generator	Moose Visitor Center	Diesel	1	125	500	62,500	184	172	2,596	559	96,313	210
Generator	Moose Maintenance	Diesel	1	300	500	150,000	442	412	6,231	1,343	231,150	505
Generator	Coulter Bay Visitor Center	Diesel	1	60	500	30,000	88	82	1,246	269	46,230	101
Generator	Coulter Bay Lift Station	Diesel	1	40	500	20,000	59	55	831	179	30,820	67
Generator	Jenny Lake	Diesel	1	40	500	20,000	59	55	831	179	30,820	67
		DieselGeneratorTotals	5		1,000	282,500	833	776	11,735	2,529	435,333	950
Emission Factors from AP-42, Chapter 3.3 Table 3.3-1 for diesel generators rated less than 448 kW Fonnula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51 E-03

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PMro (Ibs/yr)	SO_2 (Ibs/yr)	NO, (lbs/yr)	CO (lbs/yr)	CO_2 (Ibs/yr)	VOC (Ibs/yr)
Jackson Lake Lodge												
Generator	Main Lodge	Diesel	1	500	500	250,000	235	1,355	8,040	1,843	385,250	214
Generator	Main Lodge	Diesel	1	360	500	180,000	169	976	5,789	1,327	277,380	154
		Diesel Generator Totals	2		1,000	430,000	403	2,331	13,829	3,169	662,630	369
Emission Factors from AP-42, Chapter 3.3 Table 3.3-1 for diesel generators rated less than 448 kW							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51E-03
Emission Factors from AP-42, Chapter 3.4-1 for diesel generators rated greater than 448 kW, S=0.5 percent							7.00E-04	0.00809*S	2.40E-02	5.50E-03	1.15E+00	6.40E-04
Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)												
Generator	Main Lodge	Gasoline	1	5	500	2,500	2	2	37	1,471	3,618	74
		Diesel Generator Totals	1		500	2,500	2	2	37	1,471	3,618	74
Emission Factors from AP-42, Chapter 3.4-1 for generators rated less than 448 kW, S=.05 Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)							7.10E-04	5.91E-04	I.10E-02	4.39E-01	1.08E+00	2.20E-02
		All Generator Totals	3		1,500	432,500	406	2,333	13,866	4,640	666,248	442

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run lime (hrs/yr)	Output (kW-hr/yr)	PM_{10} (lbs/yr)	SO_2 (lbs/yr)	NO, (Ibs/yr)	CO (lbs/yr)	CO_2 (Ibs/yr)	VOC (lbs/yr)
Coulter Bay Village												
Generator	Main Lodge	Diesel	I	200	500	100,000	295	275	4,154	895	154,100	336
Generator	Grocery Store	Diesel	1	250	500	125,000	369	343	5,193	1,119	192,625	420
Generator	Laundrette	Diesel	1	75	500	37,500	111	103	1,558	336	57,788	126
		DieselGeneratorTotals	3		1,500	262,500	774	721	10,904	2,350	404,513	883
Emission Factors from AP-42, Chapter 3.3 Table 3.3-1 for diesel generators rated less than 448 kW							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51E-03
Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)												
Generator	Cabin Office	Gasoline	1	5	500	2,500	2	2	37	1,471	3,618	74
		Diesel Generator Totals	1		500	2,500	2	2	37	1,471	3,618	74
Emission Factors from AP-42, Chapter 3.4-1 for generators rated less than 448 kW, S=.05							7.10E-04	5.91 E-04	1.10E-02	4.39E-01	1.08E+00	2.20E-02
Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)												
		All Generator Totals	4		2,000	265,000	776	723	10,941	3,820	408,131	9571

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PMrp (Ibs/yr)	SO_2 (Ibs/yr)	NO, (Ibs/yr)	CO (lbs/yr)	CO_2 (Ibs/yr)	VOC (lbs/yr)
Jenny Lake Lodge												
Generator	Main Lodge	Diesel	1	200	500	100,000	295	275	4,154	895	154,100	336
		Diesel Generator Totals	1		500	100,000	295	275	4,154	895	154,100	336
Emission Factors from AP-42, Chapter 3.3 Table 3.3-1 for diesel generators rated less than 448 kW							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51 E-03
Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)												

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PMro (Ibs/yr)	SO_2 (Ibs/yr)	NO((lbs/yr)	CO (lbs/yr)	CO, (Ibs/yr)	VOC (lbs/yr)
Flagg Ranch Resort												
Generator	Lower Flagg	Diesel	1	500	500	250,000	235	1,355	8,040	1,843	385,250	214
Generator	Upper Flagg	Diesel	1	400	500	200,000	590	549	8,308	1,790	308,200	673
		Diesel Generator Totals	2		1,000	450,000	824	1,904	16,348	3,633	693,450	887
Emission Factors from AP-42, Chapter 3.3 Table 3.3-1 for diesel generators rated less than 448 kW							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51 E-03
Emission Factors from AP-42, Chapter 3.4-I for diesel generators rated greater than 448 kW, S=0.5 percent							7.00E-04	0.00809*S	2.40E-02	5.50E-03	1.15E+00	6.40E-04
Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)												

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PM_{10} (lbs/yr)	SO_2 (lbs/yr)	NO_x (lbs/yr)	CO (lbs/yr)	CO_2 (lbs/yr)	VOC (lbs/yr)
Jackson Hole Airport												
Generator	FAA/VOR	Propane	1	30	500	15,000	3	27	71	17		4
	Propane Generator Totals		1	30	500	15,000	3	27	71	17		4
Emission Factors from AP-42, Chapter 3.1-1 for natural gas/propane (lb/hp-hr), S=.18 Formula = Emission Factor (lb/hp-hr) * 608 (g/kW-hr / lb/hp-hr) * Output (kW-hr/yr) / 453.6 (g/lb)							1.54E-04	7.52E-03*S	3.53E-03	8.60E-04		1.92E-04
Generator	Terminal	Diesel	1	600	500	300,000	281	1,626	9,648	2,211	462,300	257
Generator	Tower	Diesel	1	50	500	25,000	74	69	1,039	224	38,525	84
Generator	Tower	Diesel	1	25	500	12,500	37	34	519	112	19,263	42
	Diesel Generator Totals		3		1,500	337,500	392	1,729	11,206	2,547	520,088	383
Emission Factors from AP-42, Chapter 3.3 Table 3.3-1 for diesel generators rated less than 448 kW							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51E-03
Emission Factors from AP-42, Chapter 3.4-1 for diesel generators rated greater than 448 kW, S=0.5 percent Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)							7.00E-04	0.00809*S	2.40E-02	5.50E-03	1.15E+00	6.40E-04
	All Generator Totals		4		2,000	352,500	395	1,756	11,277	2,564	520,088	3871

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PM_{10} (lbs/yr)	SO_2 (lbs/yr)	NO_x (lbs/yr)	CO (lbs/yr)	CO_2 (lbs/yr)	VOC (lbs/yr)
Jackson Lake Dam, Bureau of Reclamation												
Generator	Shop/Residence	Diesel	1	200	500	100,000	295	275	4,154	895	154,100	336
	Diesel Generator Totals		1		500	100,000	295	275	4,154	895	154,100	336
Emission Factors from AP-42, Chapter 3.3 Table 3.3-1 for diesel generators rated less than 448 kW Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51E-03

	PM_{10}	SO_2	NO_x	CO	CO_2	VOC
Park Totals (lbs/yr)	3,824	8,042	72,475	18,976	3,031,449	4,296
Park Totals (tons/yr)	1.91	4.02	36.24	9.49	1,515.72	2.15

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Moose Maintenance
City:	Boise
State:	Wyoming
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	Gasoline UST

Tank Dimensions

Shell Length (ft):	17.00
Diameter (ft):	10.00
Volume (gallons):	10,000.00
Turnovers:	3.75
Net Throughput (gal/yr):	37, 500.00
Is Tank Heated (yin):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0

Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp. (deg F)	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
								Max.					
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoliriej RVP9)	227.36	0.00	227.36

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Colter Bay Maintenance
City:	Boise
State:	Wyoming
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	Gasoline UST

Tank Dimensions

Shell Length (ft):	17.00
Diameter (ft):	10.00
Volume (gallons):	10, 000.00
Turnovers:	3.75
Net Throughput (gal/yr):	37,500.00
Is Tank Heated (yin):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4M
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component		Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp.	Vapor Pressures (psia)			Vapor Mot. Weight	Liquid Mass	Vapor Mass	Mal. WeigN	Basis for Vapor Pressure CalsAalions
							Min						
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline_(RVP 9)	227.36	0.00	227.36

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Jackson Lake Service Stations
City:	Casper
State:	Wyoming
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	Gasoline UST

Tank Dimensions

Shell Length (ft):	17.00
Diameter (ft):	10.00
Volume (gallons):	10,000.00
Turnovers:	7.15
Net Throughput (gal/yr):	71, 500.00
Is Tank Heated (yin):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses lbs		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 9)	433.51	0.00	433.51

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Colter Bay Marina
City:	Casper
State:	Wyoming
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	Gasoline UST

Tank Dimensions

Shell Length (ft):	13.50
Diameter (ft):	8.00
Volume (gallons):	5,000.00
Turnovers:	14.00
Net Throughput (gal/yr):	70,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses lbs		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 9)	424.41	0.00	424.41

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Triangle X Ranch 1
City:	
State:	Wyoming
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	Gasoline UST

Tank Dimensions

Shell Length (ft):	13.50
Diameter (ft):	8.00
Volume (gallons):	5,000.00
Turnovers:	3.44
Net Throughput (gal/yr):	17,220.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) g	Mm	Max	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mot. Weight	Liquid Mass Fraci	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 9)	104.41	0.00	104.41

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Triangle X Ranch 2
City:	
State:	Wyoming
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	Gasoline UST

Tank Dimensions

Shell Length (ft):	13.50
Diameter (ft):	8.00
Volume (gallons):	5,000.00
Turnovers:	0.64
Net Throughput (gal/yr):	3,180.00
Is Tank Heated (yin):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Coponent	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

		Losses(lbs	
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 9)	19.28	0.00	19.28

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Flagg Ranch Service Station
City:	
State:	Wyoming
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	Gasoline UST

Tank Dimensions

Shell Length (ft):	25.50
Diameter (ft):	10.00
Volume (gallons):	15,000.00
Turnovers:	1.33
Net Throughput (gal/yr):	20,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Bulk Temp.	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbS)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline(Ryp9j	121.26	0.00	121.26

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Flagg Ranch Service Station 2
City:	
State:	Wyoming
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	Gasoline uST

Tank Dimensions

Shell Length (ft):	17.00
Diameter (ft):	10.00
Volume (gallons):	10,000.00
Turnovers:	0.00
Net Throughput (gal/yr):	13,000.00
Is Tank Heated (yin):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)		M	Liquid Bulk Temp. (degFL__,__	Vapor Pressures (psia) Avg.		Max.	Vapor Mol. Weight	- - - - - Liquid Mass Fract.	Vapor Mass Fract.__	_Mol. Weig_ht	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

Components	Working Loss	LossesObs) Breathing Loss	Total Emissions
Gasoline (RVP 9)	78.82	0 .00	78.82

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Signal Mountain Store 1
City:	
State:	Wyoming
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	Gasoline UST

Tank Dimensions

Shell Length (ft):	20.50
Diameter (ft):	10.00
Volume (gallons):	12,000.00
Turnovers:	7.29
Net Throughput (gal/yr):	87,500.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg,	MA_	Max.	Liquid Bulk Temp. (deg	Vapor Pressures (psia)		Max	Vapor Mol.	Liquid Mass	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

Components	Losses(lbsl Workin Lossf	Breathing Loss	Total Emissions
Gasoline (RVP9	530.51	.00	530.51

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Signal Mountain Store 2
City:	
State:	Wyoming
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	Gasoline UST

Tank Dimensions

Shell Length (ft):		14.00
Diameter (ft):		10.00
Volume (gallons):		8,000.00
Turnovers:		3.96
Net Throughput (gal/yr):		31,650.00
Is Tank Heated (yin):	N	
Is Tank Underground (y/n):	Y	

Paint Characteristics

Shell Color/Shade:
Shell Condition:

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg. Fem._ - _	Vapor Pressures (psia) ,Avg,_			Vapor Mol. Weight_	Liquid Mass Fract,_	Vapor Mass FracL,	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

		Losses(lbs	
Components	Working Loss	Breathing Loss	Total Emissions
Gasollae(Hyp 9)	191.89	0.00	191.89

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Signal Mountain Store 3
City:	
State:	Wyoming
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	Gasoline UST

Tank Dimensions

Shell Length (ft):	12.00
Diameter (ft):	5.30
Volume (gallons):	2,000.00
Turnovers:	0.00
Net Throughput (gal/yr):	9,200.00
Is Tank Heated (yin):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	iii		Vapor Mol. Weight	Liquid Mass Fract	Vapor Mass Fract	Mol. ht	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses lbs		
Components	Working	Loss	Total Emissions
Gasoline RVP 9	55.78	0.00	55 78

TANKS 4.0
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Jackson Lake Dam
City:	
State:	Wyoming
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	1000 gal AST

Tank Dimensions

Shell Length (ft):	6.00
Diameter (ft):	5.30
Volume (gallons):	1,000.00
Turnovers:	0.00
Net Throughput (gal/yr):	750.00
Is Tank Heated (yin):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition:	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	52.81	46.88	58.74	50.94	3.9950	3.5384	4.4980	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)

Annual Emission Calculations	
Standing Losses (lb):	137.3393
Vapor Space Volume (cu lt):	84.3127
Vapor Density (lb/cu ft):	0.0487
Vapor Space Expansion Factor:	0.1431
Vented Vapor Saturation Factor:	0.6406
Tank Vapor Space Volume	
Vapor Space Volume (cu ft):	84.3127
Tank Diameter (ft):	5.3000
Effective Diameter (ft):	6.3647
Vapor Space Outage (ft):	2.6500
Tank Shell Length (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0487
Vapor Molecular Weight (lb/lb-mole):	67.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.9950
Daily Avg. Liquid Surface Temp. (deg. R):	512.4830
Daily Average Ambient Temp. (deg. F):	50.9208
Ideal Gas Constant R (psia cult / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	510.6108
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,400.5355
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.1431
Daily Vapor Temperature Range (deg. R):	23.7125
Daily Vapor Pressure Range (psia):	0.9596
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.9950
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	3.5384
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	4.4980
Daily Avg. Liquid Surface Temp. (deg R):	512.4830
Daily Min. Liquid Surface Temp. (deg R):	506.5548
Daily Max. Liquid Surface Temp. (deg R):	518.4111
Daily Ambient Temp. Range (deg. R):	23.6750
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.6406
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.9950
Vapor Space Outage (ft):	2.6500
Working Losses (lb):	4.7797
Vapor Molecular Weight (lb/lb-mole):	67.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.9950
Annual Net Throughput (gal/yr.):	750.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (lt):	5.3000
Working Loss Product Factor:	1.0000
Total Losses (lb):	142.1190

TANKS 4.0
Emissions Report - Detail Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions_
Gasoline (RVP 9)	4.78	137.34	142.12

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Hertz
City:	
State:	a
Company:	
Type of Tank:	Horizontal Tank
Description:	Gasoline UST

Tank Dimensions

Shell Length (ft):	17.00
Diameter (ft):	10.00
Volume (gallons):	10,000.00
Turnovers:	0.00
Net Throughput (gal/yr):	40,000.00
Is Tank Heated (yin):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component		Daily Liquid Surf. Temperatures (deg F)		Max	Liquid Bulk Temp. (degF)	Vapor Pressures (psia) Avg.	Min.	Max	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbsL		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline RVP	242.52	0.00	242.52

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Avis
City:	
State:	Wyoming
Company:	
Type of Tank:	Horizontal Tank
Description:	gasoline UST

Tank Dimensions

Shell Length (ft):	17.00
Diameter (ft):	10.00
Volume (gallons):	10,000.00
Turnovers:	0.00
Net Throughput (gal/yr):	25,000.00
Is Tank Heated (yin):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

Components	Losses lbs Working Loss	Breathing Loss	Total Emissions
Gasoline RVP 9	151.58	0.00	151_58

TANKS 4M
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Alamo
City:	
State:	Wyoming
Company:	
Type of Tank:	Horizontal Tank
Description:	Gasoline UST

Tank Dimensions

Shell Length (ft):	17.00
Diameter (it):	10.00
Volume (gallons):	10,000.00
Turnovers:	0.00
Net Throughput (gal/yr):	25,000.00
Is Tank Heated (yin):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg	Min	Max.	Liquid Bulk Temp. deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mal. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline	151.58	0.00	151.58

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Budget
City:	
State:	Wyoming
Company:	
Type of Tank:	Horizontal Tank
Description:	Gasoline UST

Tank Dimensions

Shell Length (ft):		20.50
Diameter (ft):		10.00
Volume (gallons):		12,000.00
Turnovers:		1.67
Net Throughput (gal/yr):		20,000.00
Is Tank Heated (yin):	N	
Is Tank Underground (y/n):	Y	

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

		Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp.	Vapor Pressures (psia)			Vapor Mol.	Liquid Mass	Vapor Mass	Mol.	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	50.36	50.36	50.36	49.92	3.8007	3.8007	3.8007	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 9)	121.26	0.00	121.26

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Jackson Airport Fuel Farm
City:	
State:	Wyoming
Company:	
Type of Tank:	Horizontal Tank
Description:	AVGAS UST

Tank Dimensions

Shell Length (ft):	17.00
Diameter (ft):	10.00
Volume (gallons):	10,000.00
Turnovers:	4.20
Net Throughput (gal/yr):	42,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Mona)	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp.	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass FracL	Vapor Mass Fract	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 7)	All	50.36	50.36	50.36	49.92	2.8529	2.8529	2.8529	68.0000			92.00	Option 4: RVP=7, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline RVP 7	194.00	-o-.o0	194.00

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Jackson Airport Satellite Fuel Farm
City:	
State:	Wyoming
Company:	
Type of Tank:	Horizontal Tank
Description:	AVGAS UST

Tank Dimensions

Shell Length (ft):	20.50
Diameter (ft):	10.00
Volume (gallons):	12,000.00
Turnovers:	4.17
Net Throughput (gal/yr):	50,000.00
Is Tank Heated (yin):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp. (deg F)	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
				Max		Avg	Min.	Max					
Gasoline (RVP 7)	All	50.36	50.36	50.36	49.92	2.8529	2.8529	2.8529	68.0000			92.00	Option 4: RVP=7, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

Components	Losses(lbs) Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 7	230.95	0.00	230.95

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Jackson Airport Fuel Farm 1
City:	
State:	Wyoming
Company:	
Type of Tank:	Horizontal Tank
Description:	Jet A UST

Tank Dimensions

Shell Length (ft):	25.50
Diameter (ft):	10.00
Volume (gallons):	15,000.00
Turnovers:	51.53
Net Throughput (gal/yr):	773,000.00
Is Tank Heated (yin):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Mm.	Max.	Liquid Bulk Temp. (egF)	Vapor Pressures (psia) Avg			Vapor Mal. Weight	Liquid Mass Fract.	Vapor Mass Fraci.	Mol. Weight	Basis for Vapor Pressure Calculations
Jet kerosene	All	50.36	50.36	50.36	49.92	0.0059	0.0059	0.0059	130.0000			162.00	Option 5: A=12.39, B=8933

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses lbs		
Components	Working Loss	Breathing Loss	Total Emissions
Jet kerosene	1066	0.00	10.66

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Jackson Airport Fuel Farm 21
City:	
State:	Wyoming
Company:	
Type of Tank:	Horizontal Tank
Description:	Jet A UST

Tank Dimensions

Shell Length (ft):	17.00
Diameter (ft):	10.00
Volume (gallons):	10,000.00
Turnovers:	51.50
Net Throughput (gal/yr):	515,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

....		Daily Liquid Surf. Temperatures (deg F) Avg.			Liquid Bulk Temp. 0gg 9	Vapor Pressures (psia) Avg	Min.	Max.	Vapor Mol. Weight	Liquid Mass	Vapor Mass	Mol. Weight_	Basis for Vapor Pressure Calculations
Jet kerosene	All	50.36	50.36	50.36	49.92	0.0059	0.0059	0.0059	130.0000			162.00	Option 5: A=12.39, B=8933

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Jet kerosene	7.10	0.00	7.10

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Jackson Airport Satellite Fuel Farm 1
City:	
State:	Wyoming
Company:	
Type of Tank:	Horizontal Tank
Description:	Jet A UST

Tank Dimensions

Shell Length (ft):	20.50
Diameter (ft):	10.00
Volume (gallons):	12,000.00
Turnovers:	0.00
Net Throughput (gal/yr):	645,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	Y

Paint Characteristics

Shell Color/Shade:	
Shell Condition:	

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max	Liquid Bulk Temp. F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Jet kerosene	All	50.36	50.36	50.36	49.92	0.0059	0.0059	0.0059	130.0000			162.00	Option 5: A=12.39, B=8933

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

Components	Losses(lbs) Working Loss	Breathing Loss	Total Emissions
Jet kerosene	11.88	0.00	11.88

2000 ACTUAL EMISSIONS FROM FIREPLACES AT GRAND TETON NATIONAL PARK

Fireplaces

Appliance	Location	Cords/Yr	Tons/Yr	PM (Ibs/yr)	SO, (Ibs/yr)	NO, (lbs/yr)	CO (Ibs/yr)	VOC (Ibs/yr)
Fireplace	Employee Residences	140	245.70	8,501	98	639	62,064	56,265
	Triangle X Ranch	4	7.02	243	3	18	1,773	1,608
	Total	144	252.72	8,744	101	657	63,837	57,873
						tons/yr		
				4.37	0.05	0.33	31.92	28.94

Woodstoves

Location	Number	Cords	tons/yr	PM (Ibs/yr)	S02 (Ibs/yr)	NOx (Ibs/yr)	CO (Ibs/yr)	VOC (Ibs/yr)
Signal Mountain Lodge Cabins	3	6	15.60	540	6	41	3,941	3,572
Signal Mountain Lodge Cabins	1	0.5	1.30	45	1	3	328	298
Triangle X Ranch	3	11	28.60	990	11	74	7,224	6,549
Total	7	17.5	45.50	1,574	18	118	11,493	10,420
						tons/yr		
				0.79	0.01	0.06	5.75	5.21
		Totals	lbs/yr	10,318	119	775	75,330	68,292
			tons/yr	5.16	0.06	0.39	37.67	34.15

TITLE: Results of FOFEM model execution on date: 3/4/2002

FUEL CONSUMPTION CALCULATIONS

Region: Interior_West
Cover Type: SAF/SRM - SAF 218 - Lodgepole Pine
Fuel Type: Natural
Fuel Reference: FOFEM 091

FUEL CONSUMPTION TABLE

Fuel Component Name	Preburn Load (t/acre)	Consumed Load (t/acre)	Postburn Load (t/acre)	Percent Reduced (%)	Equation Reference Number	Moisture
Litter	0.60	0.60	0.00	100.0	999	
Wood (0-1/4 inch)	0.18	0.18	0.00	100.0	999	
Wood (1/4-1 inch)	0.72	0.72	0.00	100.0	999	25.0
Wood (1-3 inch)	0.60	0.59	0.01	98.4	999	
Wood (3+ inch) Sound	13.50	3.82	9.68	28.3	999	20.0
3->6	3.38	1.87	1.51	0.6		
6->9	3.38	1.07	2.30	0.3		
9->20	3.38	0.61	2.76	0.2		
20->	3.38	0.27	3.11	0.1		
Wood (3+ inch) Rotten	1.50	0.70	0.80	46.9	999	20.0
3->6	0.38	0.32	0.06	0.8		
6->9	0.38	0.21	0.17	0.5		
9->20	0.38	0.12	0.25	0.3		
20->	0.38	0.06	0.32	0.2		
Duff	15.00	6.16	8.84	41.1	2	100.0
Herbaceous	0.20	0.20	0.00	100.0	22	
Shrubs	0.25	0.15	0.10	60.0	23	
Crown foliage	6.00	0.00	6.00	0.0	37	
Crown branchwood	4.80	0.00	4.80	0.0	38	
Total Fuels	43.35	13.13	30.22	30.3		

FIRE EFFECTS ON FOREST FLOOR COMPONENTS

Forest Floor Component	Preburn Condition	Amount Consumed	Postburn Condition	Percent Reduced	Equation Number
Duff Depth (in)	1.1	0.4	0.7	36.7	6
Min Soil Exp (%)	.0	21.9	21.9	21.9	10

	Emissions -- lbs/acre flaming	smoldering	total
PM 10	6	648	654
PM 2.5	5	549	554
CH_4	2	333	335
CO	13	7312	7325
CO_2	3612	29763	33375

	Consumption tons/acre	Duration hour:min:sec
Flaming:	1.02	00:01:00
Smoldering:	12.11	01:03:00
Total:	13.13	

2001 WILDFIRE EMISSIONS AT GRAND TETON NATIONAL PARK

Fire Name	Acres	PM_{10} (Ibs/yr)	$PM_{2.5}$ (Ibs/yr)	CH_4 (Ibs/yr)	CO (Ibs/yr)	CO_2 (lbs/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)	CH_4 (tons/yr)	CO (tons/yr)	CO_2 (Ibs/yr)
Glade	2,464	1,611,456	1,365,056	825,440	18,048,800	82,236,000	806	683	413	9,024	41,118
Hetchman	661	432,294	366,194	221,435	4,841,825	22,060,875	216	183	111	2,421	11,030
Berry II	2	981	831	503	10,988	50,063	0	0	0	5	25
Wilcox	2,979	1,948,266	1,650,366	997,965	21,821,175	99,424,125	974	825	499	10,911	49,712
Moran	3,351	2,191,554	1,856,454	1,122,585	24,546,075	111,839,625	1,096	928	561	12,273	55,920
Snowshoe	200	130,800	110,800	67,000	1,465,000	6,675,000	65	55	34	733	3,338
Totals	9,657	6,315,351	5,349,701	3,234,928	70,733,863	322,285,688	3,158	2,675	1,617	35,367	161,143
Emission Factors Ohs/acre)		654	554	335	7,325	33,375					

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* ##################################################
* Grand Teton NP Winter Conditions.
* File 1, Run 1, Scenario 11.
* # # # 44 44 # 44 44 # it if # # # 44 # # # # # # # # # # #
  M584 Warning:
            The user supplied area wide average speed of 35.0
            will be used for all hours of the day. 100% of VMT
            has been assigned to a fixed combination of freeways,
            freeway ramps, arterial/collector and local roadways
            for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV

          User supplied gasoline sulfur content = 300.0 ppm.

  M616 Comment:
                User has supplied post-1999 sulfur levels.
  M 48 Warning:
               there are no sales for vehicle class HDGV8b

                     Calendar Year:  2001
                             Month:  Jan.
                          Altitude:  High
               Minimum Temperature:  10.0 (F)
```

Maximum Temperature: 30.0 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 13.5 psi
Weathered RVP: 13.5 psi
Fuel Sulfur Content: 299. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: No
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)			------	------	------	------
VMT Distribution:	0.7002	0.1410	0.1044		0.0060	0.0008	0.0016	0.0180	0.0280	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.875	1.215	1.097	1.165	0.990	0.433	0.439	0.509	2.62	0.988
Composite CO	21.91	28.86	25.79	27.55	29.17	1.308	0.931	6.582	28.12	23.184
Composite NOX :	0.913	1.332	1.551	1.425	3.966	1.267	1.212	16.834	1.29	1.356

Veh. Type:	LDGT1	LDGT2	LDGT3	LDGT4	LDDT12	LDDT34
VMT Mix:	0.0330	0.1080	0.0719	0.0325	0.0000	0.0016
Composite Emission Factors (g/mi):						
Composite VOC :	1.137	1.239	1.067	1.164	2.424	0.391
Composite CO	28.11	29.08	25.66	26.08	6.522	0.795
Composite NOX :	1.047	1.418	1.401	1.884	2.555	1.180

Veh. Type:	HDGV2B	HDGV3	HDGV4	HDGV5	HDGV6	HDGV7	HDGV8A	HDGV8B
VMT Mix:	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Composite Emission Factors (g/mi):								
Composite VOC :	0.990	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Composite CO	29.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Composite NOX :	3.966	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Veh. Type:	HDDV2B	HDDV3	HDDV4	HDDV5	HDDV6	HDDV7	HDDV8A	HDDV8B

```
            VMT Mix:     0.0020     0.0000     0.0000     0.0000     0.0000     0.0000     0.0000     0.0000
---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.378      0.000      0.000      0.000      0.000      0.000      0.000      0.000
     Composite CO        1.942      0.000      0.000      0.000      0.000      0.000      0.000      0.000
     Composite NOX :     4.150      0.000      0.000      0.000      0.000      0.000      0.000      0.000
---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # #   # # # # # # # #   #   # #
* Grand Teton NP Summer Conditions.
* File 1, Run 1, Scenario 12.
* # # # # # # #   # # #   # # # # # # # #   # #   #
  M584 Warning:
            The user supplied area wide average speed of 35.0
            will be used for all hours of the day. 100% of VMT
            has been assigned to a fixed combination of freeways,
            freeway ramps, arterial/collector and local roadways
            for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMGZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV

          User supplied gasoline sulfur content = 300.0 ppm.

  M616 Comment:
               User has supplied post-1999 sulfur levels.
```

M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year:	2001
Month:	July
Altitude:	High
Minimum Temperature:	35.0 (F)
Maximum Temperature:	85.0 (F)
Absolute Humidity:	75. grains/lb
Nominal Fuel RVP:	8.5 psi
Weathered RVP:	8.4 psi
Fuel Sulfur Content:	299. ppm
Exhaust I/M Program:	No
Evap I/M Program:	No
ATP Program:	No
Reformulated Gas:	No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.7002	0.1410	0.1044		0.0060	0.0008	0.0016	0.0180	0.0280	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.737	0.924	0.915	0.920	0.832	0.405	0.461	0.490	3.48	0.854
Composite CO	13.47	16.90	16.22	16.61	23.12	1.277	0.945	6.500	24.26	14.444
Composite NOX :	0.764	1.060	1.341	1.179	3.663	1.170	1.239	16.586	0.99	1.176

Veh. Type:	LDGT1	LDGT2	LDGT3	LDGT4	LDDT12	LDDT34
VMT Mix:	0.0330	0.1080	0.0719	0.0325	0.0000	0.0016
Composite Emission Factors (g/mi):						
Composite VOC :	0.878	0.937	0.895	0.959	2.512	0.418
Composite CO	16.55	17.01	16.13	16.43	6.775	0.824
Composite NOX :	0.840	1.127	1.208	1.635	2.574	1.212

Veh. Type:	HDGV2B	HDGV3	HDGV4	HDGVS	HDGV6	HDGV7	HDGV8A	HDGV8B
VMT Mix:	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Composite Emission Factors (g/mi):

Composite VOC :	0.832	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Composite CO	23.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Composite NOX :	3.663	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Veh. Type:	HDDV2B	HDDV3	HDDV4	HDDV5	HDDV6	HDDV7	HDDV8A	HDDV8B
VMT Mix:	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Composite Emission Factors (g/mi):

Composite VOC :	0.374	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Composite CO	1.957	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Composite NOX :	4.078	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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* ################################
* Grand Teton NP Winter Conditions.
* File 1, Run 1, Scenario 11.
* #

Calendar Year: 2001
Month: Jan.
Gasoline Fuel Sulfur Content: 299. ppm
Diesel Fuel Sulfur Content: 500. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.7002	0.1410	0.1044		0.0060	0.0008	0.0016	0.0180	0.0280	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0042	0.0047	0.0044	0.0046	0.0523	------	------	------	0.0205	0.0050
ECARBON:	------	------	------	------	------	0.1244	0.0488	0.1250	------	0.0024
OCARBON:	------	------	------	------	------	0.0351	0.0703	0.0997	------	0.0019
SO4:	0.0028	0.0049	0.0047	0.0048	0.0118	0.0049	0.0106	0.0540	0.0010	0.0043
Total Exhaust PM:	0.0071	0.0096	0.0091	0.0094	0.0640	0.1644	0.1297	0.2786	0.0215	0.0136
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0115	0.0040	0.0080
Total PM:	0.0276	0.0302	0.0297	0.0300	0.0846	0.1849	0.1503	0.3027	0.0380	0.0341
SO2:	0.0684	0.0804	0.1134	0.0944	0.1603	0.0939	0.2028	0.7715	0.0328	0.0872
NH3:	0.1016	0.1005	0.1015	0.1009	0.0451	0.0068	0.0068	0.0270	0.0113	0.0970
Idle Emissions (g/hr)										
PM Idle:	------		------	------	------	------	------	1.0557	------	0.0190

Veh. Type:	LDGT1	LDGT2	LDGT3	LDGT4	LDDT12	LDDT34
VMT Mix:	0.0330	0.1080	0.0719	0.0325	0.0000	0.0016
Composite Emission Factors (g/mi):						
Lead:	0.0000	0.0000	0.0000	0.0000	------	------
GASPM:	0.0047	0.0047	0.0044	0.0044	------	------
ECARBON:	------	------	------	------	0.1498	0.0464
OCARBON:	------	------	------	------	0.2156	0.0668

SO4:	0.0049	0.0049	0.0047	0.0047	0.0062	0.0107
Total Exhaust PM:	0.0096	0.0096	0.0091	0.0091	0.3717	0.1238
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080
Total PM:	0.0302	0.0302	0.0297	0.0297	0.3922	0.1444
SO2:	0.0804	0.0804	0.1134	0.1134	0.1196	0.2049
NH3:	0.1005	0.1005	0.1015	0.1015	0.0068	0.0068
Idle Emissions (g/hr)						
PM Idle:						

Veh. Type:	HDGV2B	HDGV3	HDGV4	HDGV5	HDGV6	HDGV7	HDGV8A	HDGV8B
VMT Mix:	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Composite Emission Factors (g/mi):								
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
GASPM:	0.0523	0.0523	0.0503	0.0504	0.0503	0.0503	0.0503	0.0000
ECARBON:								
0CARBON:								
S04:	0.0118	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Exhaust PM:	0.0640	0.0523	0.0503	0.0504	0.0503	0.0503	0.0503	0.0000
Brake:	0.0125	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tire:	0.0080	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total PM:	0.0846	0.0523	0.0503	0.0504	0.0503	0.0503	0.0503	0.0000
S02:	0.1603	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3:	0.0451	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Idle Emissions (g/hr)								
PM Idle:								

Veh. Type:	HDDV2B	HDDV3	HDDV4	HDDV5	HDDV6	HDDV7	HDDV8A	HDDV8B
VMT Mix:	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Composite Emission Factors (g/mi):								
Lead:								
GASPM:								
ECARBON:	0.0514	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0CARBON:	0.0535	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SO4:	0.0172	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Exhaust PM:	0.1221	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Brake:	0.0125	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tire:	0.0080	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total PM:	0.1426	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SO2:	0.2452	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3:	0.0270	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Idle Emissions (g/hr)								
PM Idle:	1.0617	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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* #
* Grand Teton NP Summer Conditions.
* File 1, Run 1, Scenario 12.
* # # # # # # # # # # # # # # # # # # #

Calendar Year: 2001
Month: July
Gasoline Fuel Sulfur Content: 299. ppm
Diesel Fuel Sulfur Content: 500. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.7002	0.1410	0.1044		0.0060	0.0008	0.0016	0.0180	0.0280	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0042	0.0046	0.0044	0.0045	0.0523	------	------	------	0.0205	0.0050
ECARBON:	------	------	------	------	------	0.1192	0.0485	0.1160	------	0.0023
OCARBON:	------	------	------	------	------	0.0336	0.0698	0.0926	------	0.0018
SO4:	0.0028	0.0049	0.0047	0.0048	0.0120	0.0049	0.0106	0.0540	0.0010	0.0042
Total Exhaust PM:	0.0070	0.0095	0.0091	0.0093	0.0643	0.1576	0.1289	0.2626	0.0215	0.0133
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0116	0.0040	0.0080
Total PM:	0.0276	0.0300	0.0297	0.0299	0.0848	0.1782	0.1494	0.2867	0.0380	0.0338
SO2:	0.0684	0.0804	0.1134	0.0944	0.1601	0.0929	0.2031	0.7714	0.0328	0.0872
NH3:	0.1016	0.1007	0.1015	0.1010	0.0451	0.0068	0.0068	0.0270	0.0113	0.0970
Idle Emissions (g/hr)										
PM Idle:	------	------	------	------	------	------	------	1.0472	------	0.0189

Veh. Type:	LDGT1	LDGT2	LDGT3	LDGT4	LDDT12	LDDT34
VMT Mix:	0.0330	0.1080	0.0719	0.0325	0.0000	0.0016

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000		
GASPM:	0.0046	0.0046	0.0044	0.0044		
ECARBON:	------	------	------	------	0.1498	0.0464
OCARBON:	------	------	------	------	0.2156	0.0668
SO4:	0.0049	0.0049	0.0047	0.0047	0.0062	0.0107
Total Exhaust PM:	0.0095	0.0095	0.0091	0.0091	0.3717	0.1238
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080
Total PM:	0.0300	0.0300	0.0297	0.0297	0.3922	0.1444
SO2:	0.0804	0.0804	0.1134	0.1134	0.1196	0.2049
NH3:	0.1007	0.1007	0.1015	0.1015	0.0068	0.0068

Idle Emissions (g/hr)

PM Idle:

Veh. Type:	HDGV2B	HDGV3	HDGV4	HDGV5	HDGV6	HDGV7	HDGV8A	HDGV8B
VMT Mix:	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
GASPM:	0.0523	0.0523	0.0506	0.0506	0.0506	0.0506	0.0505	0.0000
ECARBON:								
OCARBON:	------	------	------	------	------	------	------	------
SO4:	0.0120	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Exhaust PM:	0.0643	0.0523	0.0506	0.0506	0.0506	0.0506	0.0505	0.0000
Brake:	0.0125	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tire:	0.0080	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total PM:	0.0848	0.0523	0.0506	0.0506	0.0506	0.0506	0.0505	0.0000
SO2:	0.1601	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3:	0.0451	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Idle Emissions (g/hr)

PM Idle:

Veh. Type:	HDDV2B	HDDV3	HDDV4	HDDV5	HDDV6	HDDV7	HDDV8A	HDDV8B
VMT Mix:	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Composite Emission Factors (g/mi):

Lead:

GASPM:

ECARBON:	0.0503	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
OCARBON:	0.0523	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SO4:	0.0171	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Exhaust PM:	0.1198	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Brake:	0.0125	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tire:	0.0080	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total PM:	0.1403	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SO2:	0.2450	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3:	0.0270	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Idle Emissions (g/hr)								
PM Idle:	1.0504	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

GRAND TETON NATIONAL PARK VISITOR VEHICLE EMISSIONS

Paved Road Annual VMT
55,780,030

Emission Factors (glmi) - All Vehicles

	NOx	CO	VOC	PM 1p (Paved) Exhaust, Brake, and Tire	Fugitive	Total
Summer	1.176	14.444	0.854	0.0338	0.84	0.8738
Winter	1.356	23.184	0.988	0.0341	0.84	0.8741
Average	1.266	18.814	0.921			0.874

Emissions (tonslyr) - All Vehicles

NOx	CO	VOC	Paved PM 10
77.68	1,154.39	56.51	53.62

Emissions (Ibslyr) - All Vehicles

NOx	CO	VOC	Paved PM_{10}
155,359	2,308,780	113,021	107,248

GRAND TETON NATIONAL PARK NPS AND GSA VEHICLES

	LDGV	LDGT	HDGV	HDDV	Total
Total Miles	1,065,000	0	0	45,000	1,110,000

Emission Factors (glmi) - LDGV

	NOx	**CO**	**VOC**	**PM 10** Exhaust, Brake, and Tire	**PM 10** Fugitive	**PM 10** Total
Summer	0.7640	13.4700	0.7370	0.0276	0.8400	0.8676
Winter	0.9130	21.9100	0.8750	0.0276	0.8400	0.8676
Average	0.8385	17.6900	0.8060			0.8676

Emissions (tonslyr) - LDGV

NOx	**CO**	**VOC**	**PM1o**
0.98	20.72	0.94	1.02

Emissions (lbslyr) - LDGV

NOx	CO	VOC	PM10
1,965	41,448	1,888	2,033

Emission Factors (glmi) - HDDV

	NOx	**CO**	**VOC**	PM 10 **Exhaust, Brake, and Tire**	PM 10 **Fugitive**	PM 10 **Total**
Summer	16.586	6.500	0.490	0.287	0.840	1.127
Winter	16.834	6.582	0.509	0.303	0.840	1.143
Average	16.710	6.541	0.500			1.135

Emissions (tonslyr) - HDDV

NOx	**CO**	**VOC**	PM 1o
0.83	0.32	0.02	0.06

Emissions (tonslyr) - Total

NOx	**CO**	**VOC**	PM 1o
1.81	21.05	0.97	1.07

Emissions (lbslyr) - Total

NOx	**CO**	**VOC**	**PM 1o**
3,619	42,095	1,938	2,145

COLTER BAY VILLAGE VEHICLES

	LDGV	LDGT	HDGV	HDDV	Total
Total Miles	20,000	35,000	0	70,000	125,000

Emission Factors (glmi) - **LDGV**

	NOx	CO	VOC	PM,o Exhaust, Brake, and Tire	PM,o Fugitive	PM,o Total
Summer	0.7640	13.4700	0.7370	0.0276	0.8400	0.8676
Winter	0.9130	21.9100	0.8750	0.0276	0.8400	0.8676
Average	0.8385	17.6900	0.8060			0.8676

Emissions (tonslyr) - **LDGV**

NOx	CO	**VOC**	PM_{10}
0.02	0.39	0.02	0.02

Emission Factors (glmi) - LDGT

	NOx	CO	VOC	PM_{10} Exhaust, Brake, and Tire	PM_{10} Fugitive	PM_{10} Total
Summer	1.179	16.610	0.920	0.030	0.840	0.870
Winter	1.425	27.550	1.165	0.030	0.840	0.870
Average	1.302	22.080	1.043			0.870

Emissions (tonslyr) - LDGT

NOx	CO	VOC	PM_{10}
0.05	0.85	0.04	0.03

Emission Factors (glmi) - HDGV

	NOx	CO	VOC	PM_{10} Exhaust, Brake, and Tire	PM_{10} Fugitive	PM_{10} Total
Summer	3.663	23.120	0.832	0.085	0.840	0.925
Winter	3.966	29.170	0.990	0.085	0.840	0.925
Average	3.815	26.145	0.911			0.925

Emissions (tonslyr) - HDGV

NOx	CO	VOC	PM,o
0.00	0.00	0.00	0.00

Emission Factors (glmi) - HDDV

	NOx	CO	VOC	PM_{10} Exhaust, Brake, and Tire	PM_{10} Fugitive	PM_{10} Total
Summer	16.586	6.500	0.490	0.287	0.840	1.127
Winter	16.834	6.582	0.509	0.303	0.840	1.143
Average	16.710	6.541	0.500			1.135

Emissions (tonslyr) - HDDV

NOx	CO	VOC	PM.
1.29	0.50	0.04	0.09

Emissions (tonslyr) - Total

NOx	CO	VOC	PM_{10}
1.36	1.74	0.10	0.14

Emissions (lbslyr) - Total

NOx	CO	VOC	PM_{10}
2,710	3,486	193	280

JACKSON LAKE LODGE VEHICLES

	LDGV	LDGT	HDGV	HDDV	Total
Total Miles	200,000	350,000	0	400,000	950,000

Emission Factors (glmi) - LDGV

	NOx	CO	VOC	PM10 Exhaust, **Brake,** **and** Tire	PM10 Fugitive	PM10 Total
Summer	0.7640	13.4700	0.7370	0.0276	0.8400	0.8676
Winter	0.9130	21.9100	0.8750	0.0276	0.8400	0.8676
Average	0.8385	17.6900	0.8060			0.8676

Emissions (tons/yr) - **LDGV**

NO.	CO	**VOC**	PM.o
0.18	3.89	0.18	0.19

Emission Factors (glmi) - LDGT

	NOx	CO	VOC	PM10 Exhaust, Brake, and Tire	PM10 Fugitive	PM10 Total
Summer	1.179	16.610	0.920	0.030	0.840	0.870
Winter	1.425	27.550	1.165	0.030	0.840	0.870
Average	1.302	22.080	1.043			0.870

Emissions (tonslyr) - LDGT

NOx	CO	VOC	PM10
0.50	8.50	0.40	0.33

Emission Factors (g/mi) - **HDGV**

	NOx	CO	VOC	PM10 Exhaust, Brake, and Tire	PM10 Fugitive	PM10 Total
Summer	3.663	23.120	0.832	0.085	0.840	0.925
Winter	3.966	29.170	0.990	0.085	0.840	0.925
Average	3.815	26.145	0.911			0.925

Emissions (tonslyr) - HDGV

NOx	CO	VOC	PM10
0.00	0.00	0.00	0.00

Emission Factors (glmi) - HDDV

	NOx	CO	VOC	PM10 Exhaust, Brake, and Tire	PM10 Fugitive	PM10 Total
Summer	16.586	6.500	0.490	0.287	0.840	1.127
Winter	16.834	6.582	0.509	0.303	0.840	1.143
Average	16.710	6.541	0.500			1.135

Emissions (tonslyr) - HDDV

NOx	CO	VOC	PM..
7.35	2.88	0.22	0.50

Emissions (tonslyr) - Total

NOx	CO	VOC	PM.
8.04	15.27	0.80	1.03

Emissions (Ibslyr) - Total

NOx	CO	VOC	PM,o
16,076	30,541	1,597	2,050

JENNY LAKE LODGE VEHICLES

	LDGV	LDGT	HDGV	HDDV	Total
Total Miles	10,500	2,000	0	20,000	32,500

Emission Factors (g/mi) - LDGV

	NOx	CO	VOC	PM_{10} Exhaust, Brake, and Tire	PM_{10} Fugitive	PM_{10} Total
Summer	0.7640	13.4700	0.7370	0.0276	0.8400	0.8676
Winter	0.9130	21.9100	0.8750	0.0276	0.8400	0.8676
Average	0.8385	17.6900	0.8060			0.8676

Emissions (tons/yr) - **LDGV**

NOx	CO	**VOC**	PM_{10}
0.01	0.20	0.01	0.01

Emission Factors (g/mi) - LDGT

	NOx	CO	VOC	PM_{10} Exhaust, Brake, and Tire	PM_{10} Fugitive	PM_{10} Total
Summer	1.179	16.610	0.920	0.030	0.840	0.870
Winter	1.425	27.550	1.165	0.030	0.840	0.870
Average	1.302	22.080	1.043			0.870

Emissions (tons/yr) - LDGT

NOx	CO	VOC	PM_{10}
0.00	0.05	0.00	0.00

Emission Factors **(g/mi) - HDGV**

	NOx	CO	VOC	**PM_{10}** Exhaust, Brake, and Tire	**PM_{10}** Fugitive	**PM_{10}** Total
Summer	3.663	23.120	0.832	0.085	0.840	0.925
Winter	3.966	29.170	0.990	0.085	0.840	0.925
Average	3.815	26.145	0.911			0.925

Emissions (tons/yr) - HDGV

NOx	CO	VOC	PM_{10}
0.00	0.00	0.00	0.00

Emission Factors (g/mi) - HDDV

	NOx	CO	VOC	PM_{10} Exhaust, Brake, and Tire	PM_{10} Fugitive	PM_{10} Total
Summer	16.586	6.500	0.490	0.287	0.840	1.127
Winter	16.834	6.582	0.509	0.303	0.840	1.143
Average	16.710	6.541	0.500			1.135

Emissions (tons/yr) - HDDV

NOx	CO	VOC	PM_{10}
0.37	0.14	0.01	0.02

Emissions (tons/yr) - Total

NOx	CO	VOC	PM_{10}
0.38	0.40	0.02	0.04

Emissions (lbs/yr) - Total

NOx	CO	VOC	PM_{10}
760	794	45	74

MISCELLANEOUS VEHICLES

	LDGV	LDGT	HDGV	HDDV	Total
Total Miles	285,000	0	0	0	285,000

Emission Factors (glmi) - LDGV

				PM_{10}		
	NOx	CO	VOC	Exhaust, Brake, and Tire	Fugitive	Total
Summer	0.7640	13.4700	0.7370	0.0276	0.8400	0.8676
Winter	0.9130	21.9100	0.8750	0.0276	0.8400	0.8676
Average	0.8385	17.6900	0.8060			0.8676

Emissions (tons/yr) - **LDGV**

NOx	CO	**VOC**	PM_{10}
0.26	5.55	0.25	0.27

Emission Factors (glmi) - LDGT

				PM.o		
	NOx	CO	VOC	Exhaust, Brake, and Tire	Fugitive	Total
Summer	1.179	16.610	0.920	0.030	0.840	0.870
Winter	1.425	27.550	1.165	0.030	0.840	0.870
Average	1.302	22.080	1.043			0.870

Emissions (tonslyr) - LDGT

NOx	CO	VOC	PM_{10}
0.00	0.00	0.00	0.00

Emission Factors (glmi) - HDGV

				PM_{10}		
	NOx	CO	VOC	Exhaust, Brake, and Tire	Fugitive	Total
Summer	3.663	23.120	0.832	0.085	0.840	0.925
Winter	3.966	29.170	0.990	0.085	0.840	0.925
Average	3.815	26.145	0.911			0.925

Emissions (tons/yr) - HDGV

NOx	CO	VOC	PM.
0.00	0.00	0.00	0.00

Emission Factors (glmi) - HDDV

				PM_{10}		
	NOx	CO	VOC	Exhaust, Brake, and Tire	Fugitive	Total
Summer	16.586	6.500	0.490	0.287	0.840	1.127
Winter	16.834	6.582	0.509	0.303	0.840	1.143
Average	16.710	6.541	0.500			1.135

Emissions (tonslyr) - HDDV

NOx	CO	VOC	PM_{10}
0.00	0.00	0.00	0.00

Emissions (tonslyr) - Total

NOx	CO	VOC	PM_{10}
0.26	5.55	0.25	0.27

Emissions (lbs/yr) - Total

NOx	CO	VOC	PM.
526	11,092	505	544

2000 GRAND TETON NP NONROAD VEHICLE EMISSIONS

Vehicle	No.	Emission Factors (gm/hp-hr) PM	Nox	CO	VOC	hp	load	hrs/yr	Emissions (lbs/yr) PM	Nox	CO	VOC
Tractors	4	2.04	1.03	2.31	2.19	42.35	0.68	120	62	31	70	67
										0	0	
Backhoe	3	2.04	1.03	2.31	2.19	77	0.55	120	68	35	77	73
Mule	0	2.04	1.03	2.31	2.19	15	0.55	90	0	0	0	0
Dozer	0	2.04	1.03	2.31	2.19	77	0.55	430	0	0	0	0
Grader	3	1.06	9.6	3.8	1.43	172	0.61	172	126	1,143	453	170
Sweeper	3	1.7	14	6.06	1.46	30	0.68	172	39	324	140	34
Forklift	3	1.06	9.6	3.8	1.43	172	0.61	172	126	1,143	453	170
Front End Loader	5	1.11	10.3	4.8	1.3	77	0.55	80	41	384	179	10
Roller/Compactor	1	2.04	1.03	2.31	2.19	30	0.55	80	6	3	7	6
Crane	0	1.06	9.6	3.8	1.43	172	0.61	26	0	0	0	0
Groomer	2	1	8	5	1.22	300	0.65	300	257	2,059	1,287	314
							Totals:	(lbs/yr)	727	5,123	2,666	845
								(tons/yr)	0.36	2.56	1.33	0.42

GRAND TETON NP MARINE VESSEL EMISSIONS

Diesel Engine Emission Factors [1]

Units	HC	CO	NO_x	PM	SO_2
(g/hp-hr)	1.26	1.91	8.92	0.563	0.352
(lb/hp-hr)	0.003	0.004	0.020	0.001	0.001

1 g = 0.002202 lbs
BSFC = 0.367 lb/hp-hr

[1] Source: Exhaust Emission Factors for Nonroad Engine Modeling - Compression-Ignition EPA Report No., NR-009A; Table 1

2-Stroke Gasoline Engine Emission Factors [3]

Units	HC	CO	NO_x	PM	SO_2
(g/hp-hr)	116.38	231.26	1.19	7.7	0.000
(lb/hp-hr)	0.256	0.509	0.003	0.017	0.000

4-Stroke Gasoline Engine Emission Factors [3]

Units	HC	CO	NO.	PM	SO_2
(g/hp-hr)	14.92	339.18	7.46	0.06	0.000
(lb/hp-hr)	0.033	0.747	0.016	0.000	0.000

[3] Source: Nonroad Emission Inventory Model, Draft, June 17, 1998

Criteria Pollutant Emissions [3]

Location JPS Vessel	No. of Engines	Engine Power (hp)	Hours of Operation	Load Factor	HC (lb/yr)	CO (lb/yr)	NO_x (lb/yr)	PM (lb/yr)	SO_2 (lb/yr)
Mariner	1	200	75	0.21	103	2,352	52	0	
Mariner	1	200	75	0.21	103	2,352	52	0	
Mercury	1	200	75	0.21	103	2,352	52	0	
Mariner	1	90	75	0.21	47	1,059	23	0	
Mariner	1	90	75	0.21	47	1,059	23	0	
Honda	1	90	75	0.21	47	1,059	23	0	
MDL 1150E	1	90	75	0.21	47	1,059	23	0	
					497	11,291	248	2	
			tonslyr		0.25	5.65	0.12	0.00	
Location)ncessionaire									
Colter Bay Village	1	30	980	0.21	1,582	3,143	16	105	
	1	90	9,800	0.21	47,458	94,304	485	3,140	
					49,040	97,448	501	3,245	
Location)ncessionaire									
Jackson LeCruise Boat	1	200	360	0.21	3,874	7,698	40	256	
			Total		53,411	116,437	789	3,503	
					(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
					26.71	58.22	0.39	1.75	0.00

[3] Emissions = Emission Factor * No. of Engines * Engine Power * Hours of Operation * Load Factor

EDMS 3.23 Emissions Inventory Report

Study Name: Jackson Hole

Airport JACKSON HOLE

Report Date: 03/07/02

SUMMARY

(Tons/Year)

NAME	CO	HC	NOx	SOx	PM10
Aircraft	26.989	2.636	18.086	.648	.000
G S E/AGE/AP U	21.784	.798	5.664	.105	.181
Total	48.773	3.434	23.750	.753	.181

AIRCRAFT EMISSIONS

(Tons/Year)

Aircraft	Engine	Mode	CO	*HC*	NOx	SOx	PM10
A319	CFM56-5A1	TAXI	.000	.000	.000	.000	.000
A319	CFM56-5A1	TKOF	.041	.011	1.125	.025	.000
A319	CFM56-5A1	CLMB	.106	.027	2.311	.064	.000
A319	CFM56-5A1	ARCH	.181	.029	.579	.039	.000
A319	CFM56-5A1	APU	.249	.014	.066	.000	.000
A319	CFM56-5A1	GSE	1.779	.046	.170	.005	.008
B757-200	DEFAULT	TAXI	.000	.000	.000	.000	.000
B757-200	DEFAULT	TKOF	.051	.000	2.968	.036	.000
B757-200	DEFAULT	CLMB	.084	.002	5.410	.091	.000
B757-200	DEFAULT	APCH	.120	.004	.716	.057	.000
6757-200	DEFAULT	APU	.203	.012	.054	.000	.000
B757-200	DEFAULT	GSE	1.453	.037	.139	.004	.006
BAE146	LF507 SERIES	TAXI	.000	.000	.000	.000	.000
BAE146	LF507 SERIES	TKOF	.004	.000	.313	.012	.000
BAE146	LF507 SERIES	CLMB	.017	.001	.673	.030	.000
BAE146	LF507 SERIES	ARCH	.165	.004	.238	.020	.000
BAE146	LF507 SERIES	APU	.024	.002	.116	.000	.000
BAE146	LF507 SERIES	GSE	1.230	.032	.118	.004	.005
Cessna 150	0-200	TAXI	.000	.000	.000	.000	.000
Cessna 150	0-200	TKOF	.621	.013	.003	.000	.000
Cessna 150	0-200	CLMB	10.357	.222	.052	.001	.000
Cessna 150	0-200	APCH	8.552	.239	.008	.001	.000
Cessna 150	0-200	APU	.000	.000	.000	.000	.000
Cessna 150	0-200	GSE	.000	.000	.000	.000	.000
Learjet 35/36	TFE 731-2-2B	TAXI	.000	.000	.000	.000	.000
Learjet 35/36	TFE 731-2-2B	TKOF	.054	.004	.595	.021	.000
Learjet 35/36	TFE 731-2-2B	CLMB	.084	.005	.539	.022	.000
Learjet 35/36	TFE 731-2-2B	APCH	1.142	.217	.301	.028	.000
Learjet 35/36	TFE 731-2-2B	APU	.000	.000	.000	.000	.000
Learjet 35/36	TFE 731-2-2B	GSE	.401	.120	1.102	.025	.051
PA-42 Cheyenne	PT6A-41	TAXI	.000	.000	.000	.000	.000
PA-42 Cheyenne	PT6A-41	TKOF	.063	.022	.099	.007	.000

PA-42 Cheyenne	PT6A-41	CLMB	.373	.116	.434	.031	.000
PA-42 Cheyenne	PT6A-41	APCH	2.079	1.357	.277	.032	.000
PA-42 Cheyenne	PT6A-41	APU	.000	.000	.000	.000	.000
PA-42 Cheyenne	PT6A-41	GSE	.325	.098	.894	.020	.041
SHORT 360	PT6A-65AR	TAXI	.000	.000	.000	.000	.000
SHORT 360	PT6A-65AR	TKOF	.073	.000	.184	.013	.000
SHORT 360	PT6A-65AR	CLMB	.558	.000	.755	.059	.000
SHORT 360	PT6A-65AR	APCH	2.264	.363	.506	.059	.000
SHORT 360	PT6A-65AR	APU	.302	.029	1.489	.000	.000
SHORT 360	PT6A-65AR	GSE	15.818	.408	1.516	.047	.070

** Denotes User Created Aircraft

EDMS 3.23 Study Information Jackson Hole

Date: Thursday, March 07, 2002
Study Created: Monday, March 04, 2002
Study Pathname: C:\EDMS\JACKSON HOLE\Jackson Hole.EDM

Airport: JACKSON HOLE , WY JAC
Airport Location (lat / lon): 43-36-23.652N 110-44-17.250W
Field elevation: 6445
Metric airport layout units selected
Average temperature: 58.
Mixing Height: 3000
Vehicle fleet year: 2002

Hourly Profiles:
DEFAULT

Hour	Fraction of Peak	Hour	Fraction of Peak	Hour	Fraction of Peak
1	1.000	9	1.000	17	1.000
2	1.000	10	1.000	18	1.000
3	1.000	11	1.000	19	1.000
4	1.000	12	1.000	20	1.000
5	1.000	13	1.000	21	1.000
6	1.000	14	1.000	22	1.000
7	1.000	15	1.000	23	1.000
8	1.000	16	1.000	24	1.000

Daily Profiles:
DEFAULT

Day	Fraction of Peak	Day	Fraction of Peak
Monday	1.000	Friday	1.000
Tuesday	1.000	Saturday	1.000
Wednesday	1.000	Sunday	1.000
Thursday	1.000		

Monthly Profiles:
DEFAULT

Month	Fraction of Peak	Month	Fraction of Peak
January	1.000	July	1.000
February	1.000	August	1.000
March	1.000	September	1.000
April	1.000	October	1.000
May	1.000	November	1.000
June	1.000	December	1.000

Aircraft:

Aircraft Name	Engine Type	Aircraft Category	Identification
B757-200	DEFAULT	LCJP	B757-200

Annual LTO: 000000000384
TGO: 0
Annual Average Taxi Time: 0.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	15.00
Diesel Belt Loader	15.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	15.00
Diesel Cabin Service	15.00

Aircraft Name	Engine Type	Aircraft Category	Identification
A319	CFM56-5A1	LCJP	A319/A320

Annual LTO: 000000000470
TGO: 0
Annual Average Taxi Time: 0.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	15.00
Diesel Belt Loader	15.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	15.00
Diesel Cabin Service	15.00

Aircraft Name	Engine Type	Aircraft Category	Identification
BAE146	LF507 SERIES	LCJP	BAE 146

Annual LTO: 000000000325
TGO: 0
Annual Average Taxi Time: 0.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	15.00
Diesel Cabin Service	15.00
Diesel Belt Loader	15.00

Diesel Aircraft Tug Narrow	6.00
APU GTCP 36 (80HP)	15.00

Aircraft Name	Engine Type	Aircraft Category	Identification
Cessna 150	0-200	SGPP	GA Single Engine

Annual LTO: 000000005670
TGO: 0
Annual Average Taxi Time: 0.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
Learjet 35/36	TFE 731-2-2B	SGJB	GA Corporate Jet

Annual LTO: 000000003600
TGO: 0
Annual Average Taxi Time: 0.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Diesel Fuel Truck	15.00
Diesel Aircraft Tug Narrow	6.00

Aircraft Name	Engine Type	Aircraft Category	Identification
PA-42 Cheyenne	PT6A-41	SGTB	GA Twin Engine

Annual LTO: 000000002920
TGO: 0
Annual Average Taxi Time: 0.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Diesel Fuel Truck	15.00
Diesel Aircraft Tug Narrow	6.00

Aircraft Name	Engine Type	Aircraft Category	Identification
SHORT 360	PT6A-65AR	SCTP	Commuter Turboprop

Annual LTO: 000000004179

TGO: 0

Annual Average Taxi Time: 0.00

Annual Average Queue Time: 0.00

Hourly Profile: DEFAULT

Daily Profile: DEFAULT

Monthly Profile: DEFAULT

Assigned Gate:

Aircraft does not use configurations

Assigned Taxiway 1: -NONE-

Assigned Taxiway 2: -NONE-

Assigned Taxiway 3: -NONE-

Assigned Runway:

Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	15.00
Diesel Cabin Service	15.00
Diesel Belt Loader	15.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 36 (80HP)	15.00

Advanced Dispersion Settings

Urban vs. Rural flag set to urban

Aircraft Settings

Aircraft Size:	Small	Large	Heavy
Initial Sigma Y	6	15	25
Initial Sigma Z:	2	4	7

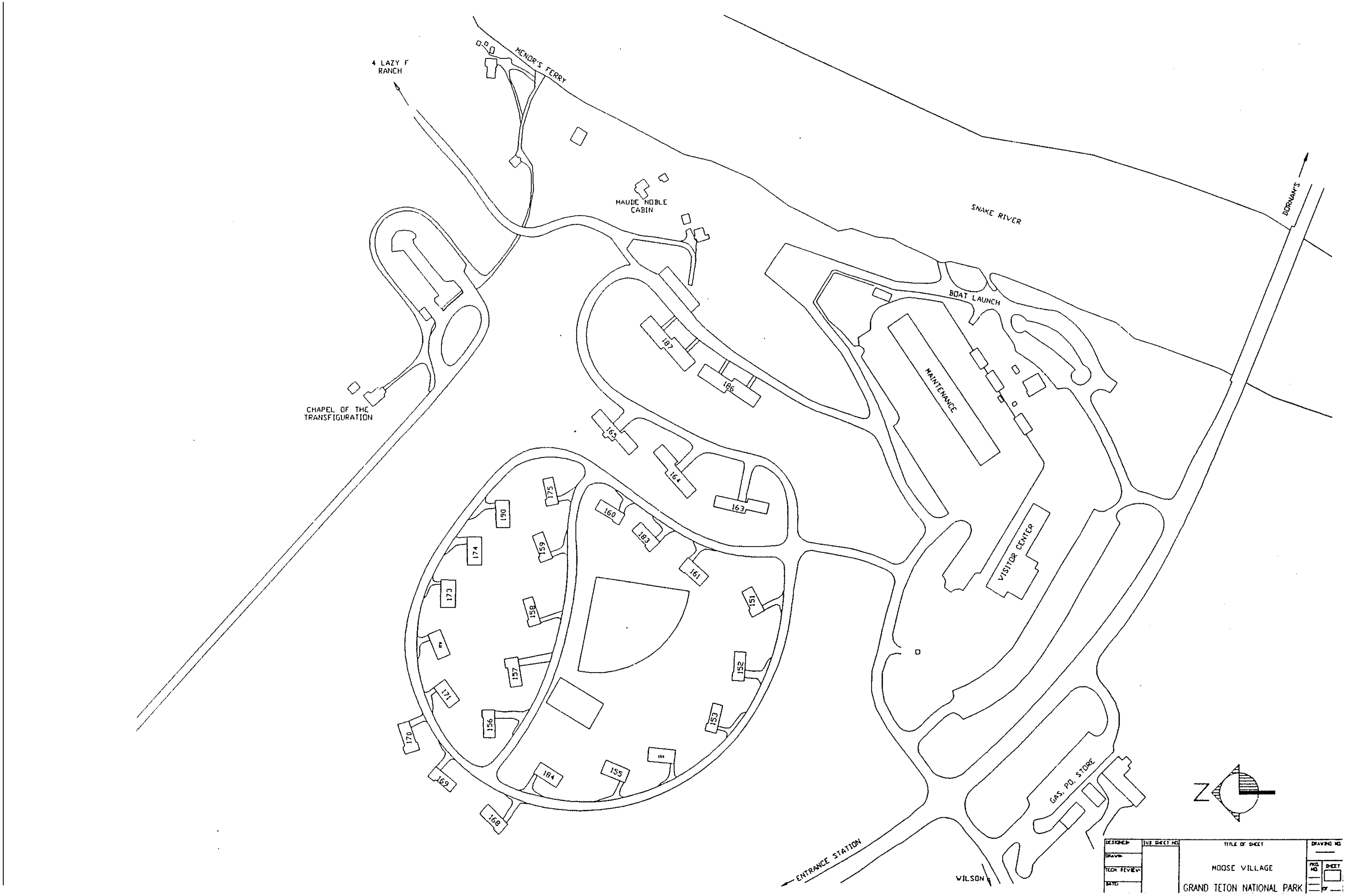
Stationary Source Settings

Initial Sigma Y: 2

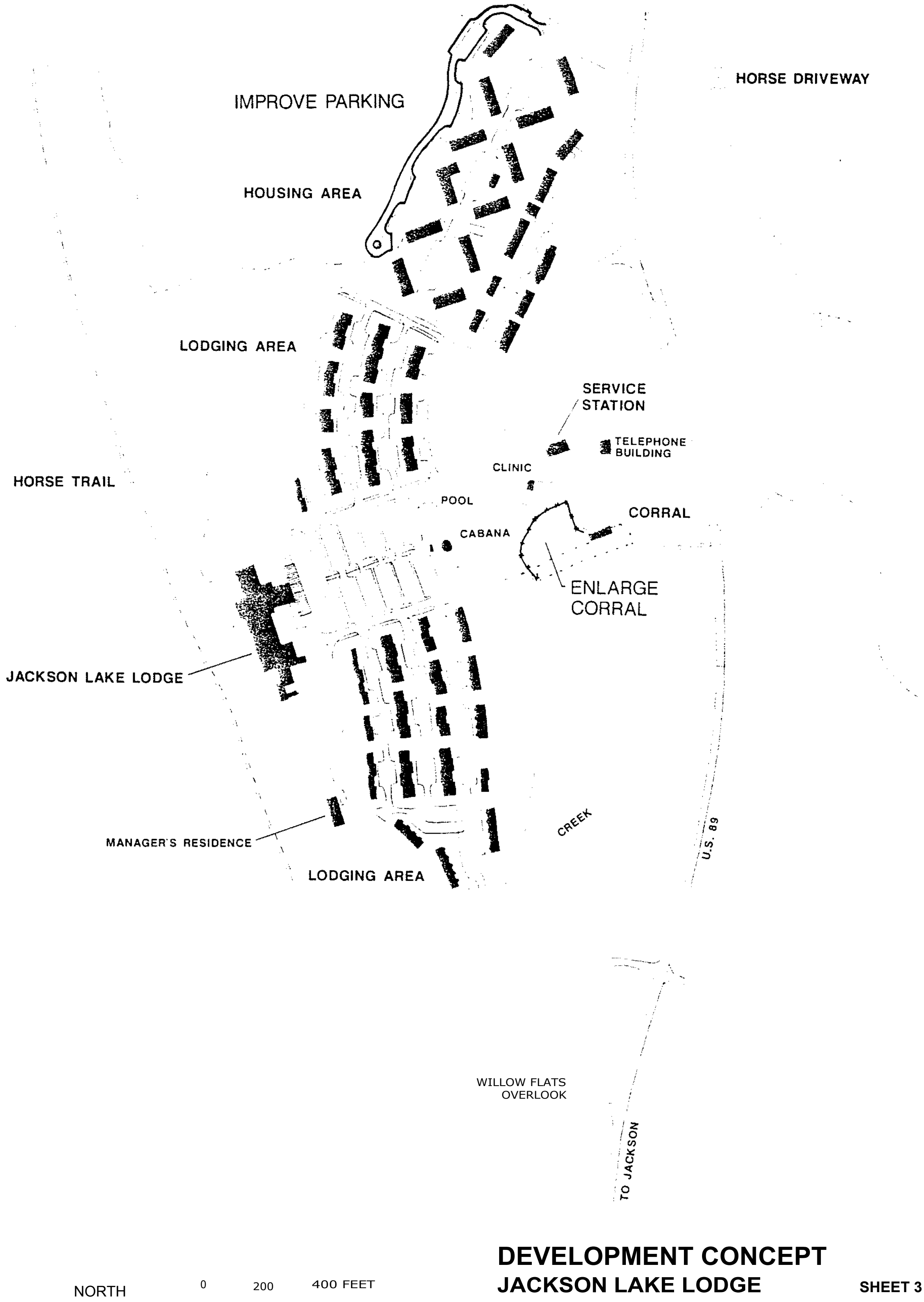
Initial Sigma Z: 2

APPENDIX C

SELECTED DEVELOPED AREAS IN GRAND TETON NATIONAL PARK



Moose Village



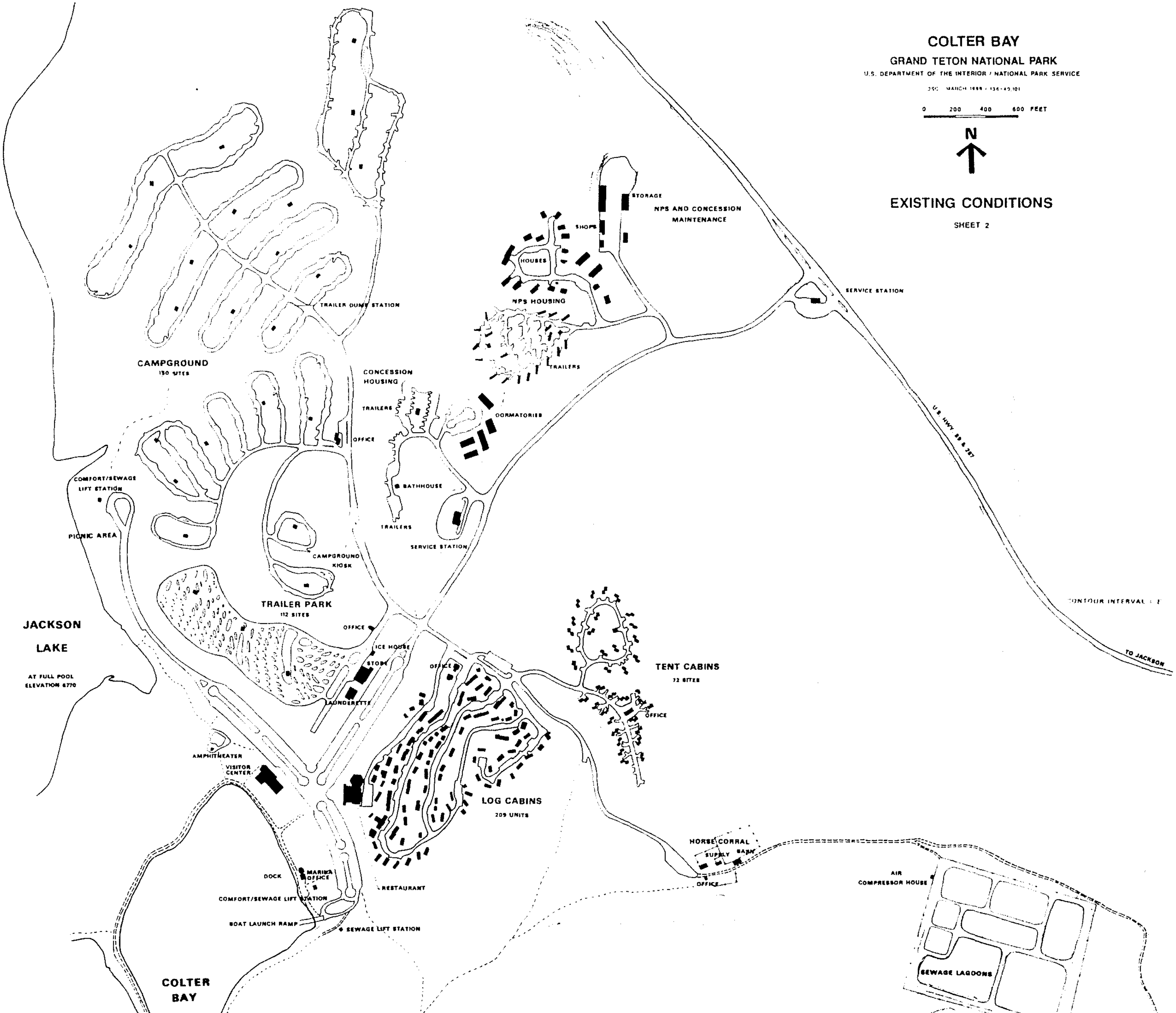
DSC / JULY 1989 1136-40.102-A

DEVELOPMENT CONCEPT
JACKSON LAKE LODGE

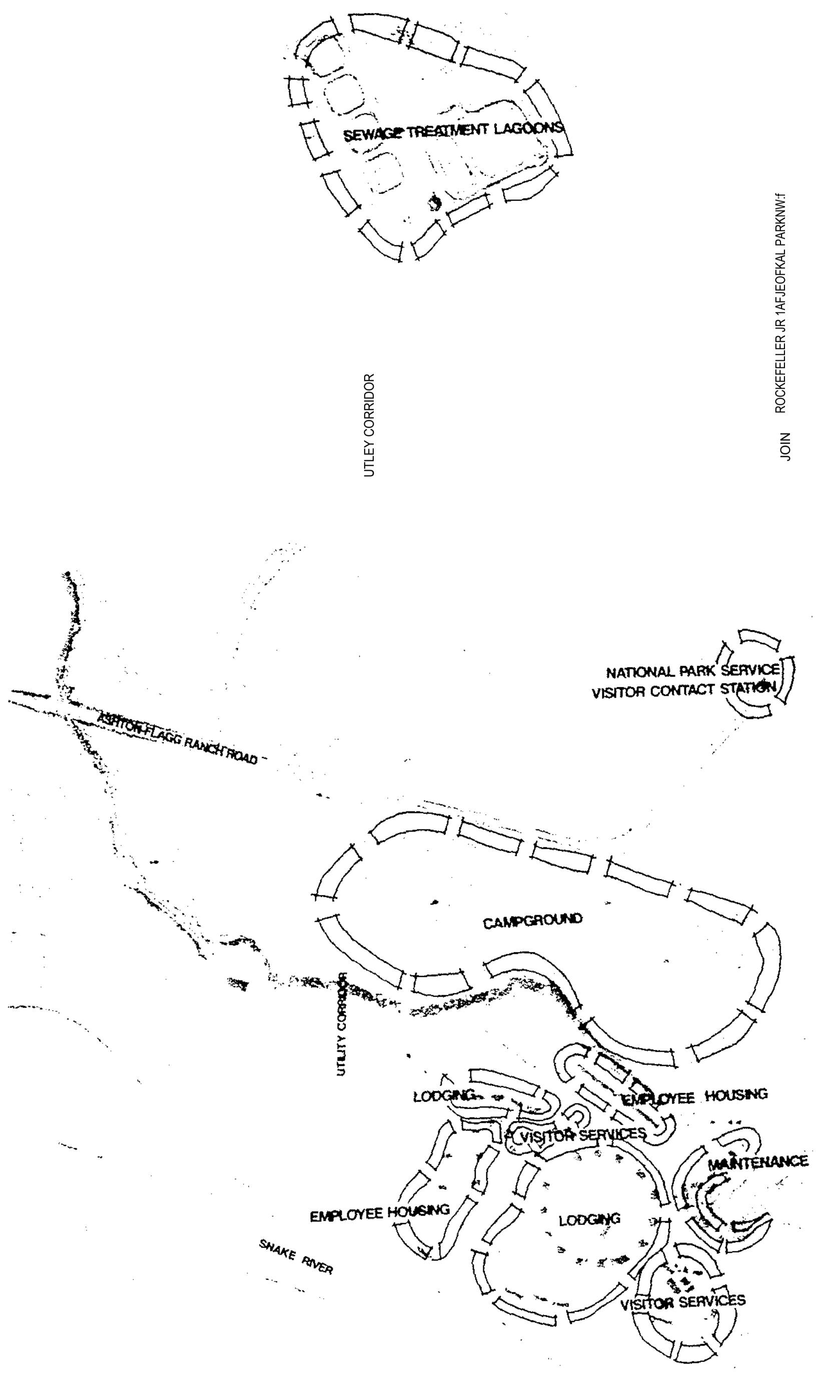
SHEET 3

GRAND TETON NATIONAL PARK
U.S. DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

Jackson Lake Lodge



Colter Bay Village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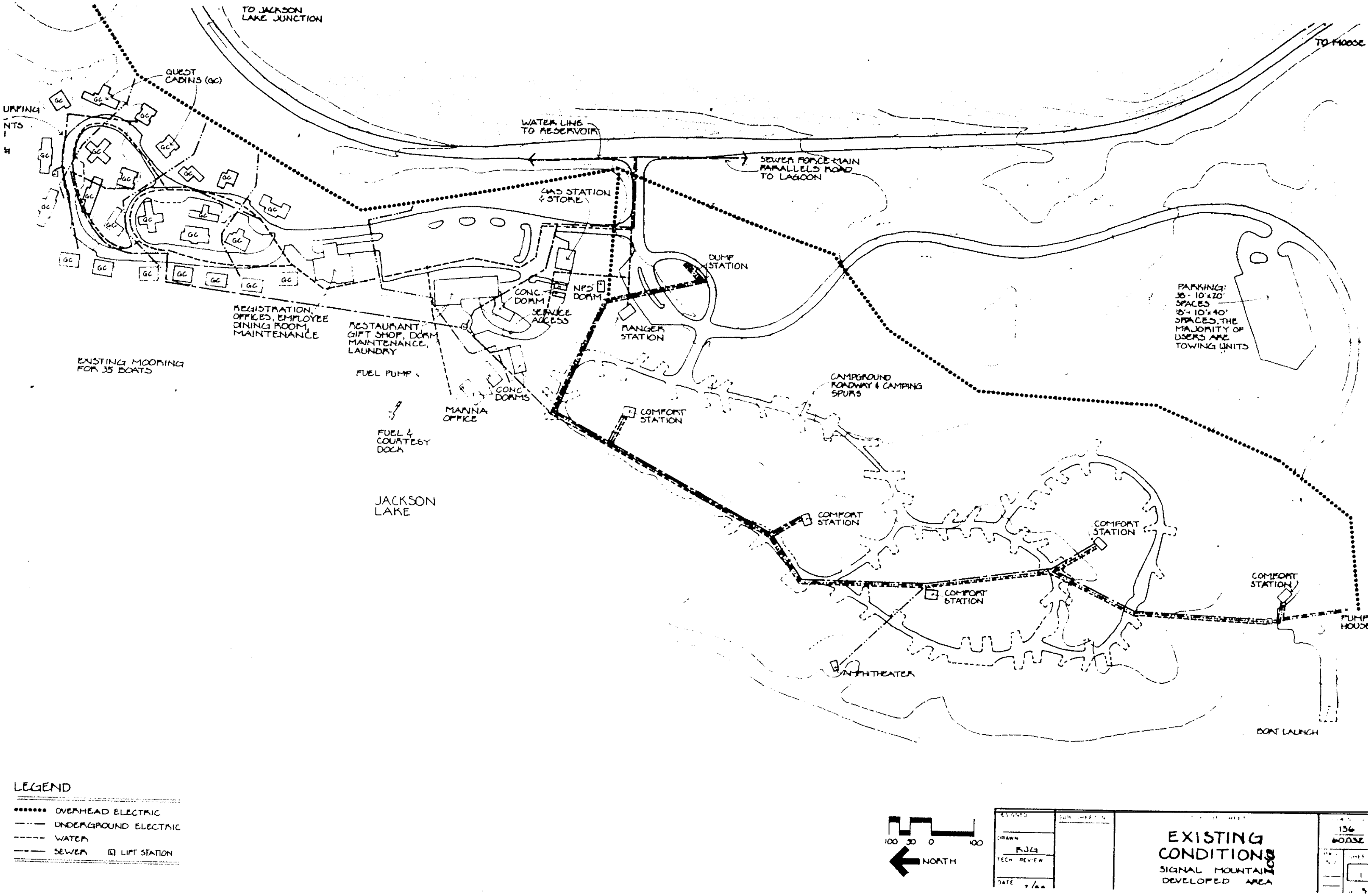
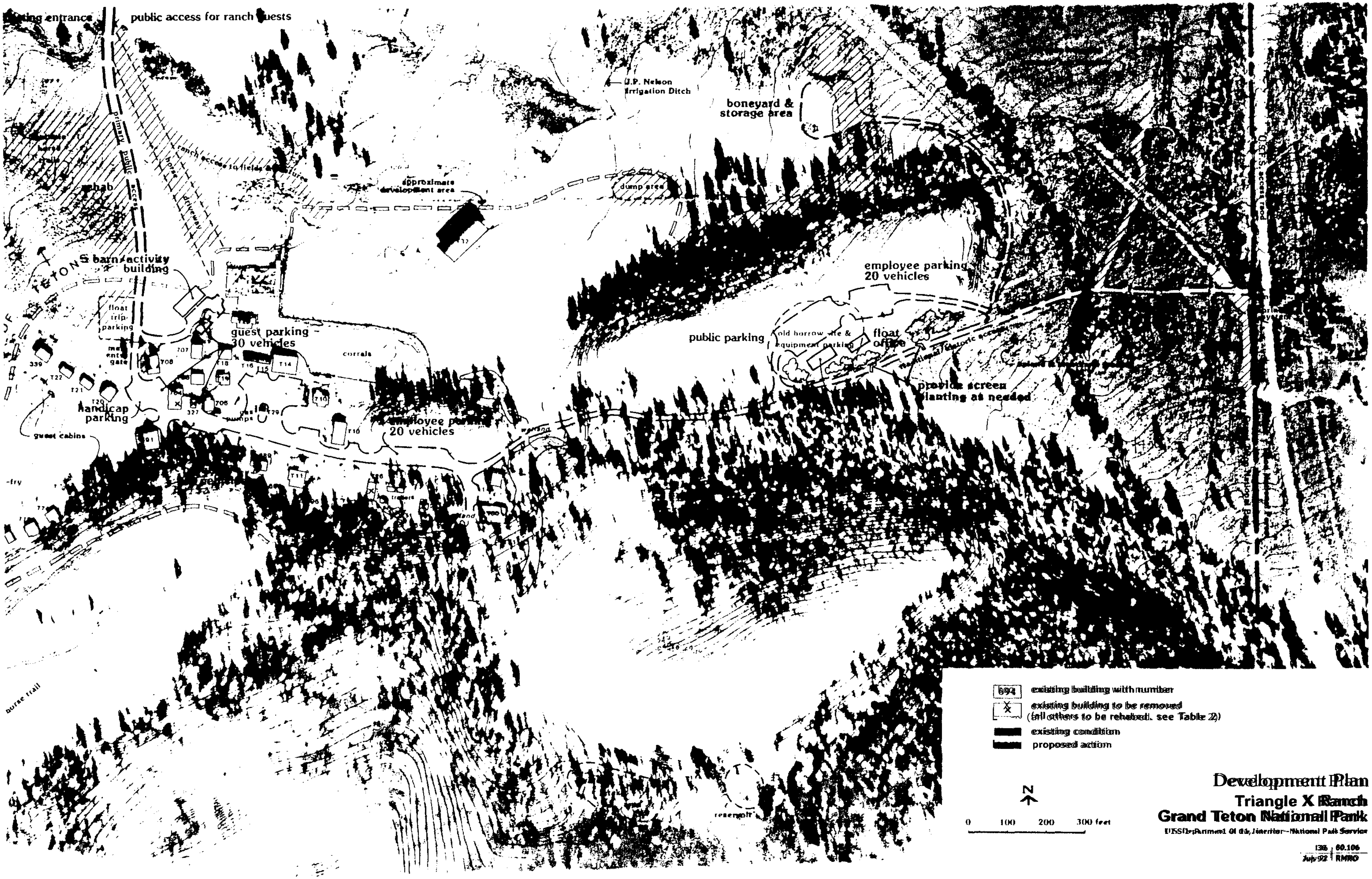
UTLEY CORRIDOR
JOIN
ROCKEFELLER JR 1AFJEOFKAL PARKNW:f
ASHTON-FLAGG RANCH ROAD
NATIONAL PARK SERVICE
VISITOR CONTACT STATION
CAMPGROUND
UTILITY CORRIDOR
LODGING
EMPLOYEE HOUSING
VISITOR SERVICES
MAINTENANCE
EMPLOYEE HOUSING
LODGING
SNAKE RIVER
VISITOR SERVICES

Flagg Ranch



Signal Mountain



Triangle X Ranch

APPENDIX D

PUBLIC USE DATA

Grand Teton National Park
Monthly Public Use Statistics
1990 - Present

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1992	36612	42238	48191	51850	186693	447762	666994	624018	343720	136914	36127	22001	2643120
1993	29975	33288	42895	40169	162582	454534	758807	613984	353141	143228	48402	31541	2712546
1994	35079	29682	50319	50751	175969	467855	593010	661706	361257	129537	37564	36859	2629588
1995	35760	43571	39922	48571	168819	445606	717919	615932	400346	139670	43978	30921	2731015
1996	35023	42816	58360	43897	161679	485606	677403	627164	398302	133597	51717	36681	2752245
1997	37291	40998	47657	41501	157661	441755	644524	638490	382007	131589	45908	49381	2658762
1998	37773	44298	45149	47384	199320	460412	648641	636959	398202	137766	53282	47874	2757060
1999	42914	39694	49885	42384	159492	416156	661051	610687	392841	139183	63873	61865	2680025
2000	56329	55986	49764	51355	182483	501849	632865	510035	329923	132501	58504	41474	**2603068"**
2001	55717	55052	59457	53784	181257	421604	603133	546323	323038				2299365
2002													
2003													
2004													
2005													
2006													
2007													
2008													

APPENDIX E

SELECTED WYOMING
AIR QUALITY REGULATIONS

TABLE OF CONTENTS

CHAPTER 6 - PERMITTING REQUIREMENTS

WYOMING AIR QUALITY STANDARDS AND REGULATIONS

(j) Within 30 days after achieving the maximum design production rate for which the permit is approved and at which each source will be operated, but not later than 90 days after initial start-up of such source, the owner or operator of such source shall conduct a performance test(s) in accordance with methods and under operating conditions approved by the Administrator and furnish the Administrator a written report of the results of each performance test.

(i) Such test shall be at the expense of the owner or operator.

(ii) The Administrator may monitor such test and may also conduct performance tests.

(iii) The owner or operator of a source shall provide the Administrator 15 days prior notice of the performance test to afford the Administrator the opportunity to have an observer present.

(iv) The Administrator may waive the requirement for performance tests if the owner or operator of a source has demonstrated by other means to the Administrator's satisfaction that the source is being operated in compliance with all State and Federal Regulations which are part of the applicable plan.

(v) If the maximum design production rate for which the permit is approved is not achieved within 90 days of initial start-up, testing will be conducted on a schedule to be defined by the Administrator. This schedule may require that the source be tested at the production rate achieved within 90 days of initial start-up and again when maximum design production rate is achieved.

(k) Approval to construct or modify shall not be required for:

(i) The installation or alteration of an air pollutant detector, air pollutants recorder, combustion controller, or combustion shutoff.

(ii) Air conditioning or ventilating systems not designed to remove air pollutants generated by or released from equipment.

(iii) Fuel burning equipment other than a smokehouse generator which has a heat input of not more than 25 million BTU per hour (6.25 billion gm-cal/hr) and bums only gaseous fuel containing not more than 20 grains total sulfur per 100 std. ft^3; has a heat input of not more than 10 million BTU/hr (2.5 billion gm-cal/hr) and burns any other fuel.

(iv) Mobile internal combustion engines.

(v) Laboratory equipment used exclusively for chemical or physical analyses.

TABLE OF CONTENTS

CHAPTER 10 - SMOKE MANAGEMENT

WYOMING AIR QUALITY STANDARDS AND REGULATIONS

Section 1. Introduction to smoke management.

(a) Chapter 10 establishes restrictions on specific burning practices. Section 1 regulates refuse burning, open burning of trade wastes, open burning for fire fighting training, and open burning of plant and forestry wastes. Section 2 specifically regulates emissions from wood waste burners.

Section 2. Open burning restrictions.

(a) *Refuse burning restrictions.*

(i) No person shall dispose of refuse by open burning, or cause, suffer, allow or permit open burning of refuse.

(ii) Regardless of provision of Subsections (a)(i) of this regulation, open burning on residential premises of refuse originating in dwelling units on the same premises shall not be a violation of this regulation in areas of low population density. A density of 100 dwelling units or less per square mile shall be used as an approximate definition of areas of low population density.

(b) Restrictions on open burning of trade wastes.

(i) No person shall cause or permit the disposal of trade wastes or conduct or cause or permit a salvage operation by open burning, except as provided in Subsection (b)(ii) of this regulation.

(ii) The open burning of material for fire fighting training, destruction of fire hazards if so designated by a local fire marshal or fire chief, or from a salvage operation or disposal of trade wastes may be permitted when it can be shown by a person that such open burning is absolutely necessary and in the public interest. Any person intending to engage in such open burning shall file a request to do so with the Division of Air Quality. The application shall state the following:

(A) the name, address, and telephone number of the person submitting the application;

(B) the type of business or activity involved;

(C) a description of the proposed equipment and operating practices, the type, quantity, and composition of wastes to be burned, and the expected composition and amount of air contaminants to be released into the atmosphere;

(D) the schedule of burning operations;

(E) the exact location where open burning will be used to dispose of such waste;

(F) reasons why no method other than open burning can be used for disposal;

(G) evidence that the proposed open burning has been approved by any fire department which may have jurisdiction. Upon approval of the application by the Division of Air Quality, the person may proceed with the operation without being in violation of Subsection (b)(i).

(c) Restrictions on open burning of plant and forestry wastes.

(i) The open burning of plant life grown on the premises in the course of any agricultural or forestry operation may be permitted when it can be shown that such open burning is necessary and that no fire hazard or public nuisance will occur.

Section 3. Wood waste burners.

(a) Emissions of any air contaminant from any wood waste burner discharged into the atmosphere for a period or periods aggregating more than 6 minutes in any one hour shall not exceed:

(i) An opacity of 20 percent as determined by a qualified observer.

(b) Operational requirements for all wood waste burners shall include:

(i) A thermocouple and recording pyrometer or other temperature measurement and recording device approved by the Division shall be installed and maintained;

(ii) A daily written log of the wood waste burner operation shall be maintained to determine optimum operational patterns for different fuel and atmospheric conditions. Such log shall include, but not be limited to, the time of day, draft settings, exit gas temperature, type of fuel, and atmospheric conditions. It must be shown that there is adequate time and responsibility delegated for proper burner maintenance, operation, and control; such log or a copy shall be made available to the Division within 10 days upon request;

(iii) Asphaltic materials, rubber products, or materials which cause dense smoke discharges shall not be burned or disposed in wood waste burners;

(iv) Continuous flow conveying methods shall be utilized to convey process wood waste to the combustion chamber of the wood waste burners.

(c) During startup and building of fires, in wood waste burners, the particulate, opacity, and darkness limits specified in this regulation may be exceeded for not more than 60 minutes in eight hours. Materials prohibited in Subsection (b)(iii) shall not be used for startup and building of fires in wood waste burners.

(d) The Administrator may waive the temperature monitoring and record keeping requirements of Subsections (b)(i) and (b)(ii) upon written request of the owner or operator, provided the owner or operator adequately demonstrates operational practices which satisfy the other requirements of this regulation. Any waiver granted under this paragraph may be revoked should the Administrator determine that the operational requirements of Subsections (b)(i) and (b)(ii) should be reinstated in order to achieve compliance with other provisions of this regulation.