2.0 EMISSIONS INVENTORY

2.1 PROJECT EMISSIONS

The Proposed Action includes the development of up to 3,100 natural gas wells. Wells may be developed on single well pads, on multiple well pads, or on a combination thereof.

Criteria pollutant and hazardous air pollutant (HAP) emissions were inventoried for construction activities, production activities, and ancillary facilities. Criteria pollutants included nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), volatile organic compounds (VOCs), particulate matter less than 10 microns in diameter (PM_{10}), and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). HAPs consisted of n-hexane; benzene, toluene, ethylbenzene, and xylene (BTEX); and formaldehyde. All emission calculations were completed in accordance with WDEQ-AQD oil and gas guidance (WDEQ-AQD 2001) in effect at the time the inventory was conducted, stack test data, EPA's AP-42, or other accepted engineering methods (see Appendix A, Protocol). Additions to WDEQ-AQD *Oil and Gas Production Facility Emission Control and Permitting Requirements for the Jonah and Pinedale Anticline Gas Fields* were approved by the Air Quality Advisory Board on July 28, 2004. The additional guidance became effective upon approval and applies to all wells reported to WOGCC after the approval date of July 28, 2004. The additional guidance revised emission control requirements and permitting process currently utilized under WDEQ-AQD Notice of Intent (NOI)/Presumptive Best Available Control Technology (P-BACT) permitting processes. Because the Project air emissions inventory and dispersion modeling analysis was complete prior to the adoption of the guidance referenced above, the revised guidance is not reflected in this analysis.

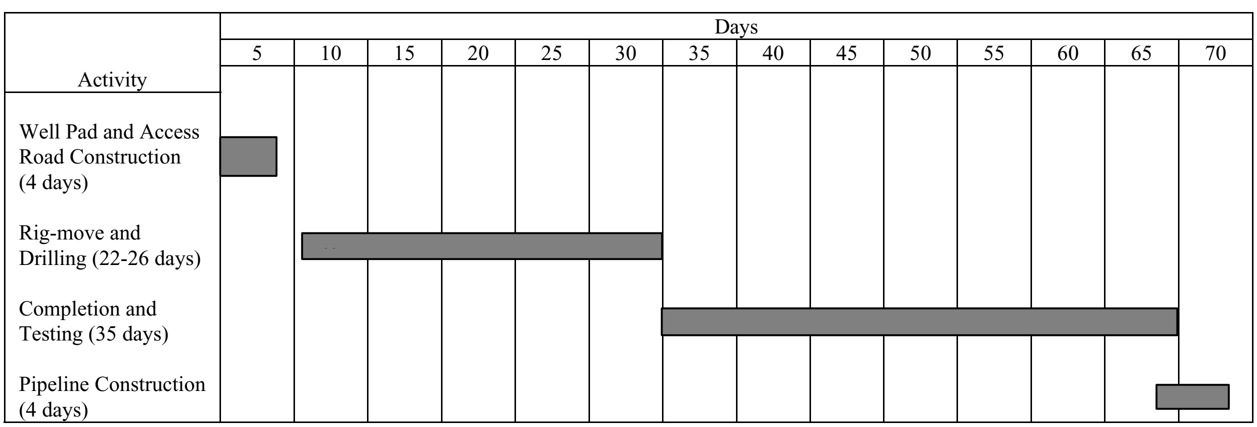
2.1.1 Construction Emissions

Construction activities are a source of primarily criteria pollutants. Emissions would occur from well pad and resource road construction and traffic, rig-move/drilling and associated traffic, completion/testing and associated traffic, pipeline installation and associated traffic, and wind erosion during construction activities. A timeline illustrating the duration of construction activities for a single well is provided in Figure 2.1. Up to 3,100 natural gas wells may be developed; however, a lesser number of developed wells are considered under two alternatives. Regardless of total wells developed, three separate WDRs were examined in this emissions inventory: 75, 150, and 250 wells developed per year.

Well pad and resource road emissions would include fugitive PM_{10} and $PM_{2.5}$ emissions from 1) construction activities and 2) traffic to and from the construction site. Other criteria pollutant emissions would occur from diesel combustion in haul trucks and heavy construction equipment. On resource roads, water would be used for fugitive dust control, effecting a control efficiency of 50%. On collector roads (e.g., Luman Road) magnesium chloride would be used for dust control, effecting a control efficiency of 85%.

After the pad is prepared, rig-move/drilling would begin. Emissions would include fugitives from unpaved road travel to and from the drilling site and emissions from diesel drilling engines (three total engines). At directionally drilled wells the amount of traffic would increase by 20%, and one additional drilling engine (a total of four engines) would be utilized. Emissions from well completion and testing would include fugitive PM_{10} and $PM_{2.5}$ emissions from traffic and

Figure 2.1 Approximate Single-Well Development Timeline.



emissions from diesel haul truck tailpipes. During the completion phase, gas and condensate are both vented to the atmosphere and combusted (flared). Emissions from the venting of natural gas include HAPs and VOCs. Flaring emissions from the combustion of natural gas and condensate include NO_x, CO, VOCs, and HAPs.

Pollutant emissions would also occur from pipeline installation activities, including general construction activities, travel to and from the pipeline construction site, and diesel combustion from on-site construction equipment.

Fugitive dust (PM_{10} and $PM_{2.5}$) would occur during well pad, road, and pipeline construction due to wind erosion on disturbed areas.

A summary of single-well construction emissions for both straight and directionally drilled wells are shown in Table 2.1. Construction emission calculations are provided in detail, showing all emission factors, input parameters, and assumptions, in Appendix B (Project Emissions Inventory).

2.1.2 Production Emissions

Field production equipment and operations would be a source of criteria pollutants and HAPs including BTEX, n-hexane, and formaldehyde. Pollutant emission sources during field production would include:

- combustion engine emissions and dust from road travel to and from well sites;
- diesel combustion emissions from haul trucks;
- combustion emissions from well site heaters;
- fugitive HAP/VOC emissions from well site equipment leaks;
- condensate storage tank flashing and flashing control;
- glycol dehydrator still vent flashing;
- wind erosion from well pad disturbed areas; and
- natural gas-fired reciprocating internal combustion compressor engines.

Table 2.1 Single-well Construction Emissions Summary for Both Straight and Directionally Drilled Wells.

	Well Pad and Access Road Construction		Rig Move and Drilling		Completion and Testing		Pipeline Construction		Totals	
Pollutant	(lb/hr)	(tons/well)	(lb/hr)	(tons/well)	(lb/hr)	(tons/well)	(lb/hr)	(tons/well)	(lb/hr)	(tons/well)
Emissions for one straight well										
NO_x	12.23	0.23	9.78[2]	2.24	0.35	0.10	7.81	0.067	30.17	2.6362
CO	3.76	0.071	3.76[2]	1.47	0.45	0.13	3.03	0.024	11.00	1.6938
SO_2	1.46	0.028	0.31[2]	0.071	0.0096	0.00	0.74	0.74	0.0067	0.8400
PM_{10}	10.76[1]	0.21	3.11[2]	0.80	6.56	1.95	4.88[3]	0.073	25.30	3.0388
$PM_{2.5}$	3.52[1]	0.069	0.93[2]	0.23	1.00	0.30	1.52[3]	0.019	6.97	0.6136
VOC	0.90	0.017	1.97[2]	0.45	0.17	57.62	0.76	0.76	0.0066	58.8545
Emissions for one directional well										
NO_x	12.23[4]	0.23	12.09[5]	3.34	0.35[6]	0.10	7.81[6]	0.067	32.48	3.7420
CO	3.76[4]	0.071	7.89[5]	2.19	0.45[6]	0.13	3.03[6]	0.024	15.13	2.4130
SO_2	1.46[4]	0.028	0.38[5]	0.106	0.0096[5]	0.00	0.74[6]	0.74	2.60	0.8751
PM_{10}	10.76[4]	0.21	3.28[5]	1.00	6.56[5]	1.95	4.88[3,6]	0.073	25.47	3.2358
$PM_{2.5}$	3.52[4]	0.069	1.07[5]	0.31	1.00[5]	0.30	1.52[3,6]	0.019	7.11	0.6958
VOC	0.90[4]	0.017	2.43[5]	0.67	0.17[5]	57.62	0.76[6]	0.76	4.26	59.0756

1 Sum of well pad construction, road construction, well pad and road construction traffic, and construction heavy equipment tailpipe emissions.
2 Sum of straight drilling traffic, straight drilling engines, and straight drilling heavy equipment tailpipe emissions.
3 Sum of pipeline construction, pipeline construction traffic, and pipeline heavy equipment tailpipe emissions.
4 Well pad and access road construction emissions for one directionally drilled well are equal to emissions for one straight drilled well.
5 Sum of directional drilling traffic, directional drilling engines, and directional drilling heavy equipment tailpipe emissions.
6 Completion and testing emissions and pipeline construction emissions are the same for straight and directional wells.

Fugitive PM_{10} and $PM_{2.5}$ emissions would occur from road travel and wind erosion from well pad disturbances. Criteria pollutant emissions would occur from diesel combustion in haul trucks traveling in the field during production.

Heaters required at each well site include an indirect heater, a dehydrator reboiler heater, and a separator heater. Stack testing was performed for NO_x and CO on these heaters by Operators in 2003 to obtain an accurate estimate of these emissions from these sources. These stack test emissions were used throughout this air quality analysis. Heater emissions for all other pollutants were calculated using AP-42.

HAPs and VOC emissions would occur from fugitive equipment leaks (i.e., valves, flanges, connections, pump seals, and opened lines). Condensate storage tank flashing and glycol dehydrator still vent flashing emissions also would include VOC/HAP emissions. Emissions from these sources were provided by Operators.

Total production emissions of criteria pollutants and HAPs occurring from a single well are presented in Table 2.2. Production emission calculations are provided in detail, in Appendix B, showing all emission factors, input parameters, and assumptions.

Table 2.2 Single-Well Production Emissions Summary.

Pollutant	Traffic Emissions [1] (tpy)	Production Emissions [2] (tpy)	Total Emissions (tpy)
NO_x	0.0084	0.045	0.054
CO	0.011	0.43	0.45
SO_2	0.00024	0.00	0.0024
PM_{10}	0.23	0.0087	0.24
$PM_{2.5}$	0.035	0.0087	0.043
VOC	0.0042	18.59	18.59
Benzene	--	1.22	1.22
Toluene	--	2.47	2.47
Ethylbenzene	--	0.13	0.13
Xylene	--	1.33	1.33
n-hexane	--	0.50	0.50

1 Includes emissions from all traffic associated with full-field production. PM_{10} and $PM_{2.5}$ emissions calculations assume 20 wells can be visited per day. Light trucks/pickups emissions on primary access roads (see Table B.2.1) are adjusted to assume 20 wells can be visited per day.

2 Includes emissions from indirect heater, separator heater, dehydrator heater, and dehydrator flashing, and fugitive HAP/VOC. Assumes 25% of the dehydrators have BTEX control, and the remaining 75% have a pump limit.

2.1.3 Total Field Emissions

Annual emissions in the JIDPA under the Proposed Action and each alternative at WDRs of 75, 150, and 250 are shown in Table 2.3. Emissions assume construction and production occurring simultaneously in the field and include one year of maximum construction emissions plus one year of production at maximum emission rates.

Construction emissions were based on well construction, drilling, drilling traffic, completion traffic, and completion flaring. Well construction emissions were based on the number of wells constructed per year and the type of well constructed. Drilling, drilling traffic, completion traffic, and completion flaring were based on the number of wells developed per year. Completion flaring operations were assumed to occur at 20% of the wells under construction. For alternatives with both directional and straight wells, a proportional split between straight and directional wells was used to determine the number of straight and directional drilling rigs.

Production emissions were calculated based on the total number of producing wells in the field. Total producing wells were equal to the difference in number of wells proposed and the number of wells constructed per year.

2.2 REGIONAL EMISSIONS INVENTORY

An emissions inventory of industrial sources within the JIDPA cumulative modeling domain was prepared for use in the cumulative air quality analysis. The modeling domain included portions of Wyoming, Colorado, Utah, and Idaho (see Map 1.2). Industrial sources and oil and gas wells permitted within a defined time frame (January 1, 2001 through June 30, 2003) through state air quality regulatory agencies and state oil and gas permitting agencies were first researched. The subset of these sources which had begun operation as of the inventory end-date was classified as

Table 2.3 Estimated Jonah Infill Drilling Project Maximum Annual In-field Emissions Summary - Construction and Production.

Alternative	Annual Development Rate	Pollutant	Annual Construction Emissions[1] (tpy)	Total Proposed Wells	Total Producing Wells	Annual Production Emissions[2] (tpy)	Total Annual Emissions (tpy)
Proposed Action (Maximum Recovery) (395 directional, 2,705 straight)	250	NO_x	744.5	3,100	2,850	360.6	1,105.1
		CO	803.9			1,412.9	2,216.8
		SO_2	25.9			0.7	26.6
		PM_{10}	976.7			676.1	1,652.8
		$PM_{2.5}$	190.1			123.8	313.9
		VOC	3,154.0			53,069.9	56,223.9
		HAPs	243.6			16,118.2	16,361.8
Alternative A (100% straight)	250	NO_x	716.5	3,100	2,850	360.6	1,077.1
		CO	783.2			1,412.9	2,196.1
		SO_2	25.6			0.7	26.3
		PM_{10}	985.7			676.7	1,662.5
		$PM_{2.5}$	191.7			123.9	315.6
		VOC	3,147.4			53,069.9	56,217.3
		HAPs	243.6			16,118.2	16,361.8
	150	NO_x	429.9	3,100	2,950	366.0	795.9
		CO	469.9			1,457.4	1,927.3
		SO_2	15.4			0.7	16.1
		PM_{10}	591.4			700.5	1,291.9
		$PM_{2.5}$	115.0			128.2	243.3
		VOC	1,888.5			54,929.0	56,817.4
		HAPs	146.2			16,683.3	16,829.4
	75	NO_x	212.7	3,100	3,025	370.0	582.8
		CO	233.5			1,490.8	1,724.3
		SO_2	7.6			0.7	8.3
		PM_{10}	295.6			718.3	1,013.9
		$PM_{2.5}$	57.4			131.5	188.9
		VOC	943.8			56,323.2	57,267.0
		HAPs	73.1			17,107.0	17,180.1

Table 2.3 (Continued)

Alternative	Annual Development Rate	Pollutant	Annual Construction Emissions[1] (tpy)	Total Proposed Wells	Total Producing Wells	Annual Production Emissions[2] (tpy)	Total Annual Emissions (tpy)
Alternative B[4] (all directional, no new pads)	250	NO_x	935.3	3,100	2,850	360.6	1,295.9
		CO	945.0			1,412.9	2,357.9
		SO_2	27.5			0.7	28.2
		PM_{10}	914.6			671.6	1,586.2
		$PM_{2.5}$	179.0			123.1	302.1
		VOC	3,198.5			53,069.9	56,268.4
		HAPs	243.6			16,118.2	16,361.8
	150	NO_x	561.2	3,100	2,950	366.0	927.1
		CO	567.0			1,457.4	2,024.4
		SO_2	16.5			0.7	17.2
		PM_{10}	548.7			695.2	1,243.9
		$PM_{2.5}$	107.4			127.4	234.9
		VOC	1,919.1			54,929.0	56,848.1
		HAPs	146.2			16,683.3	16,829.4
	75	NO_x	277.3	3,100	3,025	370.0	647.3
		CO	281.4			1,490.8	1,772.2
		SO_2	8.1			0.7	8.9
		PM_{10}	274.2			712.9	987.1
		$PM_{2.5}$	53.5			130.7	184.2
		VOC	958.9			56,323.2	57,282.2
		HAPs	73.1			17,107.0	17,180.1
Alternative C (100% straight)	250	NO_x	716.5	1,250	1,000	261.2	977.7
		CO	783.2			589.5	1,372.7
		SO_2	25.6			0.2	25.9
		PM_{10}	985.7			237.5	1,223.2
		$PM_{2.5}$	191.7			43.5	235.2
		VOC	3,147.4			18,677.3	21,824.7
		HAPs	243.6			5,664.9	5,908.5

Table 2.3 (Continued)

Alternative	Annual Development Rate	Pollutant	Annual Construction Emissions[1] (tpy)	Total Proposed Wells	Total Producing Wells	Annual Production Emissions[2] (tpy)	Total Annual Emissions (tpy)
Alternative C (cont.)	150	NO_x	429.9	1,250	1,100	266.6	696.5
		CO	469.9			634.0	1,103.9
		SO_2	15.4			0.3	15.6
		PM_{10}	591.4			261.2	852.6
		$PM_{2.5}$	115.0			47.8	162.8
		VOC	1,888.5			20,536.3	22,424.8
		HAPs	146.2			6,229.9	6,376.1
	75	NO_x	212.7	1,250	1,175	270.6	483.3
		CO	233.5			667.4	900.9
		SO_2	7.6			0.3	7.9
		PM_{10}	295.6			279.0	574.6
		$PM_{2.5}$	57.4			51.1	108.5
		VOC	943.8			21,930.6	22,874.4
		HAPs	73.1			6,653.7	6,726.8
Alternative D (100% straight)	250	NO_x	716.5	2,200	1,950	312.2	1,028.7
		CO	783.2			1,012.3	1,795.5
		SO_2	25.6			0.5	26.1
		PM_{10}	985.7			463.0	1,448.8
		$PM_{2.5}$	191.7			84.8	276.5
		VOC	3,147.4			36,338.3	39,485.8
		HAPs	243.6			11,032.8	11,276.4
	150	NO_x	429.9	2,200	2,050	317.6	747.5
		CO	469.9			1,056.8	1,526.8
		SO_2	15.4			0.5	15.9
		PM_{10}	591.4			486.8	1,078.2
		$PM_{2.5}$	115.0			89.1	204.1
		VOC	1,888.5			38,197.4	40,085.9
		HAPs	146.2			11,597.9	11,744.0

Table 2.3 (Continued)

Alternative	Annual Development Rate	Pollutant	Annual Construction Emissions[1] (tpy)	Total Proposed Wells	Total Producing Wells	Annual Production Emissions[2] (tpy)	Total Annual Emissions (tpy)
Alternative D (cont.)	75	NO_x	212.7	2,200	2,125	321.7	534.4
		CO	233.5			1,090.2	1,323.8
		SO_2	7.6			0.5	8.1
		PM_{10}	295.6			504.6	800.2
		$PM_{2.5}$	57.4			92.4	149.8
		VOC	943.8			39,591.7	40,535.5
		HAPs	73.1			12,021.6	12,094.7
Alternative E[4] (2,834 directional, 266 straight, 266 new pads)	250	NO_x	917.0	3,100	2,850	360.6	1,277.6
		CO	931.5			1,412.9	2,344.3
		SO_2	27.4			0.7	28.0
		PM_{10}	920.7			672.1	1,592.8
		$PM_{2.5}$	180.1			123.2	303.3
		VOC	3,194.2			16,190.4	19,384.7
		HAPs	243.6			16,118.2	16,361.8
	150	NO_x	549.7	3,100	2,950	366.0	915.7
		CO	558.6			1,457.4	2,016.0
		SO_2	16.4			0.7	17.1
		PM_{10}	552.4			695.7	1,248.0
		$PM_{2.5}$	108.0			127.5	235.6
		VOC	1,916.5			54,929.0	56,845.4
		HAPs	146.2			16,683.3	16,829.4
	75	NO_x	275.4	3,100	3,025	370.0	645.4
		CO	279.7			1,490.8	1,770.4
		SO_2	8.2			0.7	8.9
		PM_{10}	276.3			713.4	989.6
		$PM_{2.5}$	54.1			130.8	184.8
		VOC	958.3			56,323.2	57,281.6
		HAPs	73.1			17,107.0	17,180.1

Table 2.3 (Continued)

Alternative	Annual Development Rate	Pollutant	Annual Construction Emissions[1] (tpy)	Total Proposed Wells	Total Producing Wells	Annual Production Emissions[2] (tpy)	Total Annual Emissions (tpy)
Alternative F[4] (2,072 directional, 1,028 straight, 1,028 new pads)	250	NO_x	862.6	3,100	2,850	360.6	1,223.2
		CO	891.3			1,412.9	2,304.2
		SO_2	26.9			0.7	27.6
		PM_{10}	938.1			673.3	1,611.5
		$PM_{2.5}$	183.2			123.4	306.6
		VOC	3,181.6			53,069.9	56,251.5
		HAPs	243.6			16,118.2	16,361.8
	150	NO_x	517.3	3,100	2,950	366.0	883.3
		CO	534.6			1,457.4	1,992.0
		SO_2	16.1			0.7	16.8
		PM_{10}	562.8			697.0	1,259.8
		$PM_{2.5}$	109.9			127.7	237.6
		VOC	1,908.9			54,929.0	56,837.8
		HAPs	146.2			16,683.3	16,829.4
	75	NO_x	258.7	3,100	3,025	370.0	628.7
		CO	267.3			1,490.8	1,758.1
		SO_2	8.1			0.7	8.8
		PM_{10}	281.4			714.7	996.1
		$PM_{2.5}$	55.0			131.0	185.9
		VOC	954.4			56,323.2	57,277.7
		HAPs	73.1			17,107.0	17,180.1
Alternative G[4] (547 directional, 2,553 straight, 2,553 new pads)	250	NO_x	754.9	3,100	2,850	360.6	1,115.5
		CO	811.7			1,412.9	2,224.6
		SO_2	26.0			0.7	26.6
		PM_{10}	973.1			673.3	1,646.5
		$PM_{2.5}$	189.5			123.4	312.8
		VOC	3,156.4			53,069.9	56,226.3
		HAPs	243.6			16,118.2	16,361.8

Table 2.3 (Continued)

Alternative	Annual Development Rate	Pollutant	Annual Construction Emissions[1] (tpy)	Total Proposed Wells	Total Producing Wells	Annual Production Emissions[2] (tpy)	Total Annual Emissions (tpy)
Alternative G (cont.)	150	NO_x	452.5	3,100	2,950	366.0	818.5
		CO	486.7			1,457.4	1,944.1
		SO_2	15.6			0.7	16.3
		PM_{10}	583.8			699.6	1,283.4
		$PM_{2.5}$	113.6			128.1	241.7
		VOC	1,893.8			54,929.0	56,822.7
		HAPs	146.2			16,683.3	16,829.4
	75	NO_x	226.3	3,100	3,025	370.0	596.3
		CO	243.4			1,490.8	1,734.1
		SO_2	7.8			0.7	8.5
		PM_{10}	291.9			717.3	1,009.2
		$PM_{2.5}$	56.8			131.4	188.2
		VOC	946.9			56,323.2	57,270.1
		HAPs	73.1			17,107.0	17,180.1
Preferred Alternative (547 directional, 2,553 straight, 2,553 new pads)	250	NO_x	754.9	3,100	2,850	360.6	1,115.5
		CO	811.7			1,412.9	2,224.6
		SO_2	26.0			0.7	26.6
		PM_{10}	973.1			673.3	1,646.5
		$PM_{2.5}$	189.5			123.4	312.8
		VOC	3,156.4			53,069.9	56,226.3
		HAPs	243.6			16,118.2	16,361.8
	150	NO_x	452.5	3,100	2,950	366.0	818.5
		CO	486.7			1,457.4	1,944.1
		SO_2	15.6			0.7	16.3
		PM_{10}	583.8			699.6	1,283.4
		$PM_{2.5}$	113.6			128.1	241.7
		VOC	1,893.8			54,929.0	56,822.7
		HAPs	146.2			16,683.3	16,829.4

Table 2.3 (Continued)

Alternative	Annual Development Rate	Pollutant	Annual Construction Emissions[1] (tpy)	Total Proposed Wells	Total Producing Wells	Annual Production Emissions[2] (tpy)	Total Annual Emissions (tpy)
Preferred Alternative (cont.)	75	NO_x	226.3	3,100	3,025	370.0	596.3
		CO	243.4			1,490.8	1,734.1
		SO_2	7.8			0.7	8.5
		PM_{10}	291.9			717.3	1,009.2
		$PM_{2.5}$	56.8			131.4	188.2
		VOC	946.9			56,323.2	57,270.1
		HAPs	73.1			17,107.0	17,180.1

1 Includes emissions from well pad and access road construction and associated traffic (see Tables B.1.1, B.1.2, B.1.3, and B.1.4), rig moving and drilling and associated traffic (see Tables B.1.10, B.1.11, and B.1.12).

2 Includes emissions from indirect heater (see Table B.2.3), separator heater (see Table B.2.4), dehydrator heater (see Table B.2.4), dehydrator flashing (see table B.2.6), fugitive HAP/VOC (see Table B.2.7), and traffic associated with full-field production (see Tables B.2.1 and B.2.2). Assumes 50% of condensate storage tanks are controlled and 50% are uncontrolled, and 25% of the dehydrators have BTEX control, and the remaining 75% have a pump limit.

3 At WDR of 250, assumes emissions include 250 drilling operations occurring during the year including 125 rigs with Tier 1 emission levels (see Table B.1.8) and 125 rigs with Tier 2 emission levels (see Table B.1.9). Emissions also include 50 completion flares (see Table B.1.12) operating during the year.

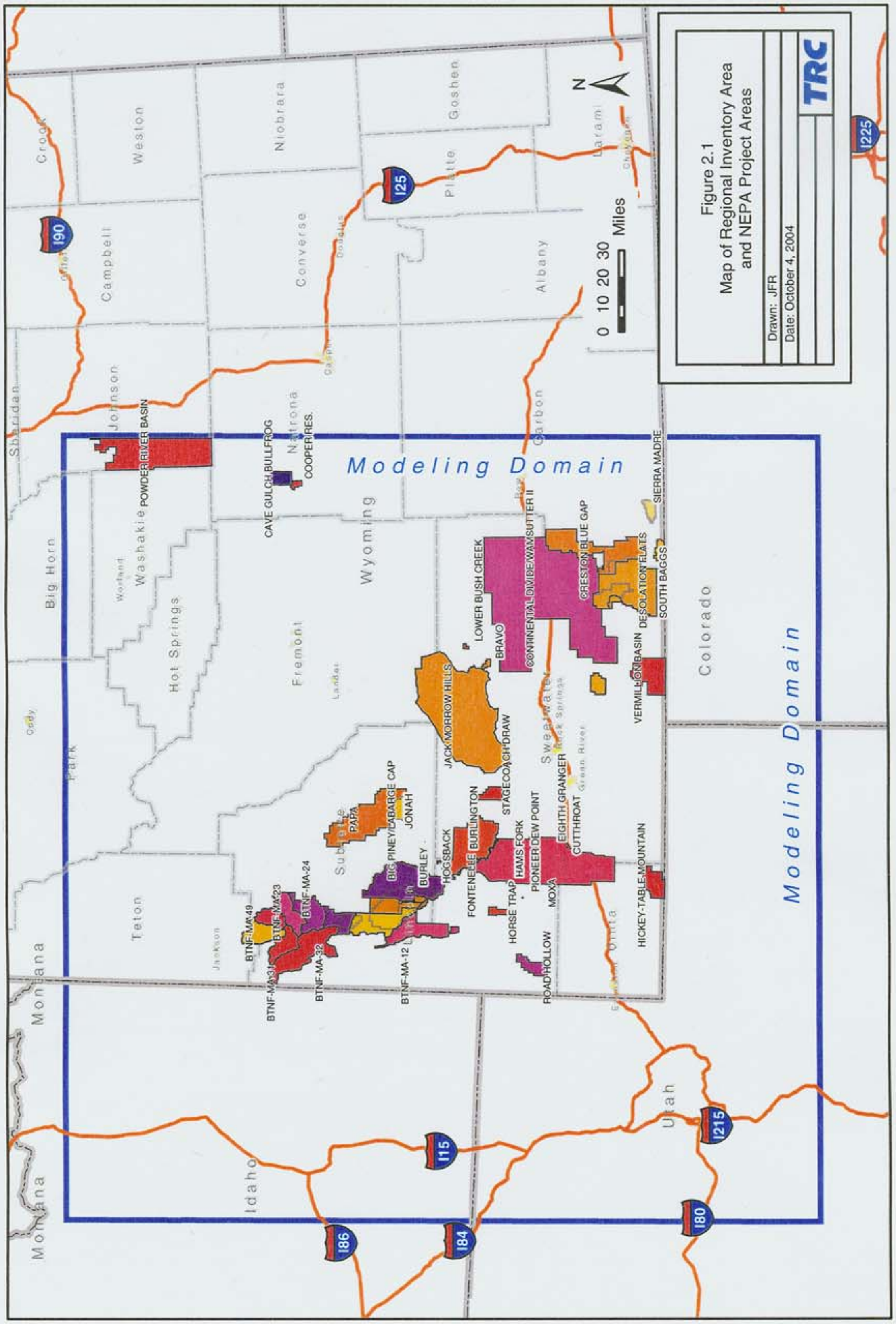
4 At WDR of 150, assumes emissions include 150 drilling operations occurring during the year including 75 rigs with Tier 1 emission levels (see Table B.1.8) and 75 rigs with Tier 2 emission levels (see Table B.1.9). Emissions also include 30 completion flares (see Table B.1.12) operating during the year.

5 At WDR of 75, assumes emissions include 75 drilling operations occurring during the year including 37 rigs with Tier 1 emission levels (see Table B.1.8) and 37 rigs with Tier 2 emission levels (see Table B.1.9). Emissions also include 15 completion flares (see Table B.1.12) operating during the year.

state-permitted sources, and those not yet in operation were classified as RFFA. Also included in the regional inventory were industrial sources proposed under NEPA in the State of Wyoming. The developed portions of these projects were assumed to be either included in monitored ambient background or included in the state-permitted source inventory. The undeveloped portions of projects proposed under NEPA were classified as RFD. In accordance with definitions agreed upon by BLM, EPA, WDEQ-AQD, and USDA Forest Service for use in EIS projects, RFD was defined as 1) the NEPA-authorized but not yet developed portions of Wyoming NEPA projects, and 2) not yet authorized NEPA projects for which air quality analyses were in progress and for which emissions had been quantified.

Map 2.1 shows the regional inventory area with NEPA project areas, and a summary of the regional inventory is shown in Table 2.4. Values presented in Table 2.4 represent the change in emissions between the inventory start-date (January 1, 2001) and the inventory end-date (June 30, 2003).

The regional inventory including methodologies used to compile the regional source emissions are provided in Appendix C and include a description of the data collected, the period of record for the data collected, inclusion and exclusion methodology, stack parameter processing methods, and the state-specific methodologies required due to significant differences in the content and completeness of data obtained from each state.



Map 2.1 Regional Inventory Area and Included NEPA Project Areas.

Table 2.4 Regional Inventory Summary of Emissions Changes from January 1, 2001 to June 30, 2003.

State	Source Category	Quantity of Sources	Emission NO_x (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Colorado	State-permitted[1]	17	177.1	2.7	64.8	22.6
	RFFA	0	--	--	--	--
	RFD	0	--	--	--	--
	Excluded	203	--	--	--	--
Idaho	State-permitted[2]	17	568.4	(112.2)	61.6	61.6
	RFFA	0	--	--	--	--
	RFD	0	--	--	--	--
	Excluded	37	--	--	--	--
Utah	State-permitted[3]	126	2,619.9	47.1	424.5	424.1
	RFD	0	--	--	--	--
	RFFA	0	--	--	--	--
	Excluded	202	--	--	--	--
Wyoming	State-permitted[4]	34	733.5	1.0	8.3	8.3
	RFFA[5]	47	486.3	(1,407.0)	(1,282.8)	(586.6)
	RFD[6]	42	3,166.5	56.1	84.0	81.9
	Excluded	693	--	--	--	--
Total	State Permitted[7]	194	4,098.9	(61.4)	559.2	516.6
	RFFA	47	486.3	(1,407.0)	(1,282.8)	(586.6)
	RFD	42	3,166.5	56.1	84.0	81.9
	Excluded	1,135	--	--	--	--
Total Change		--	7,751.7	(1,412.3)	(639.6)	11.9

1 See Appendix C, Table C.1
2 See Appendix C, Table C.3.
3 Includes state-permitted oil and gas well emissions. See Appendix C, Tables C.5 and C.9.
4 Includes state-permitted oil and gas well emissions. See Appendix C, Tables C.7 and C.9.
5 See Appendix C, Table C.11.
6 See Appendix C, Table C.12.
7 Includes state-permitted oil and gas well emissions.